Exclusive Advance Report – page 27

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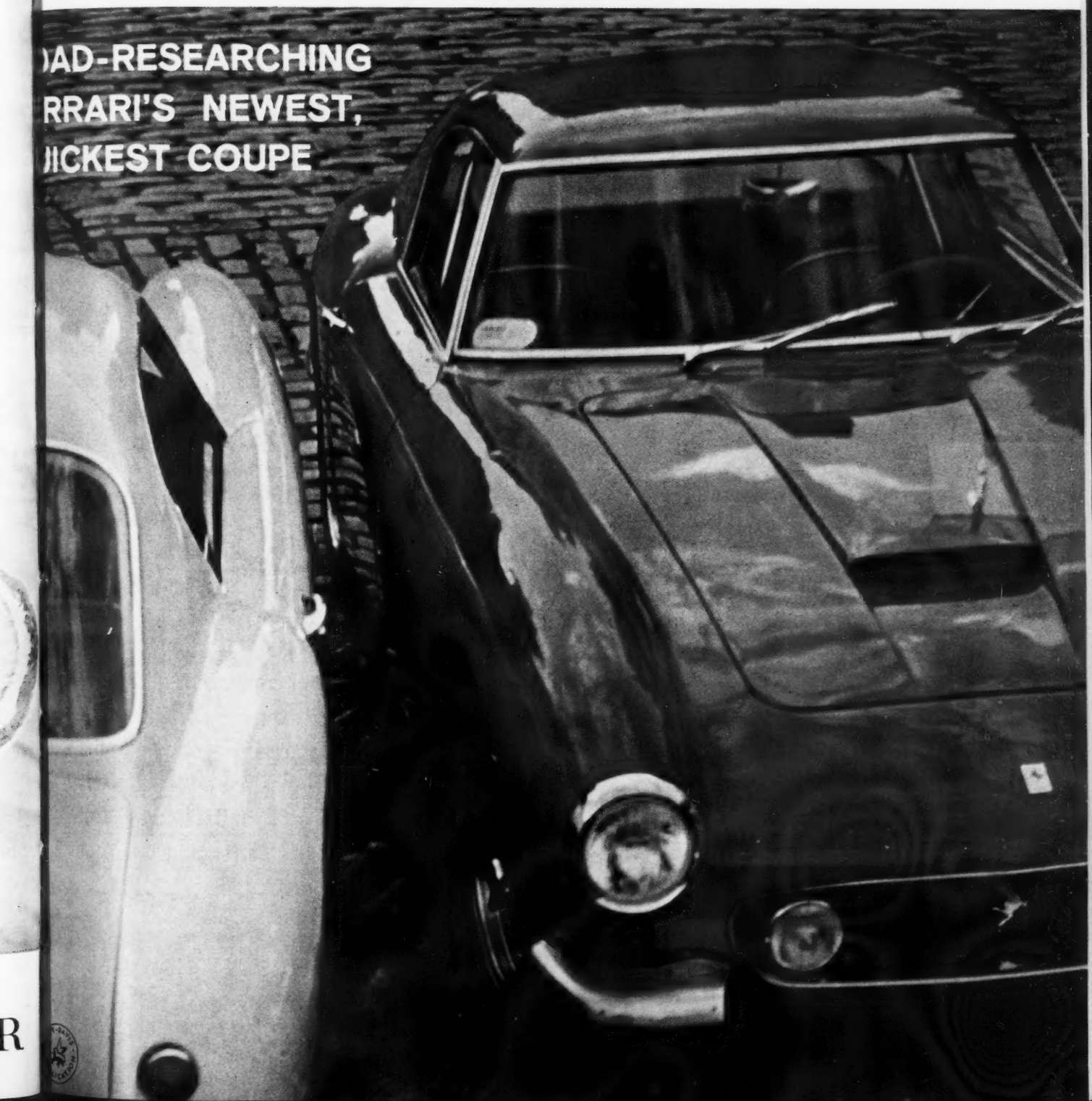

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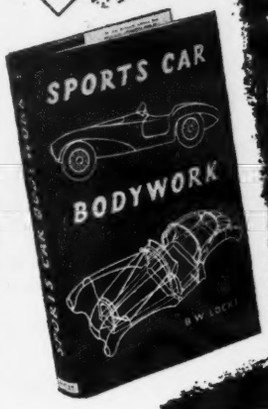

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...'the textbook of Motor Racing!' says Fangio

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SPORTS CARS ILLUSTRATED

magazine of car and driver

October 1960
Vol. 6 No. 4

road research report

road tests

men and cars

features

technical

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departments

Our cover this month is a rare picture indeed! Photographer Inger Abrahamsen managed to get two Ferrari 250/GT Berlinettas motionless at the same time. After testing the red one we can understand why owners George Arents and Charlie Kreisler are loath to let them remain idle.

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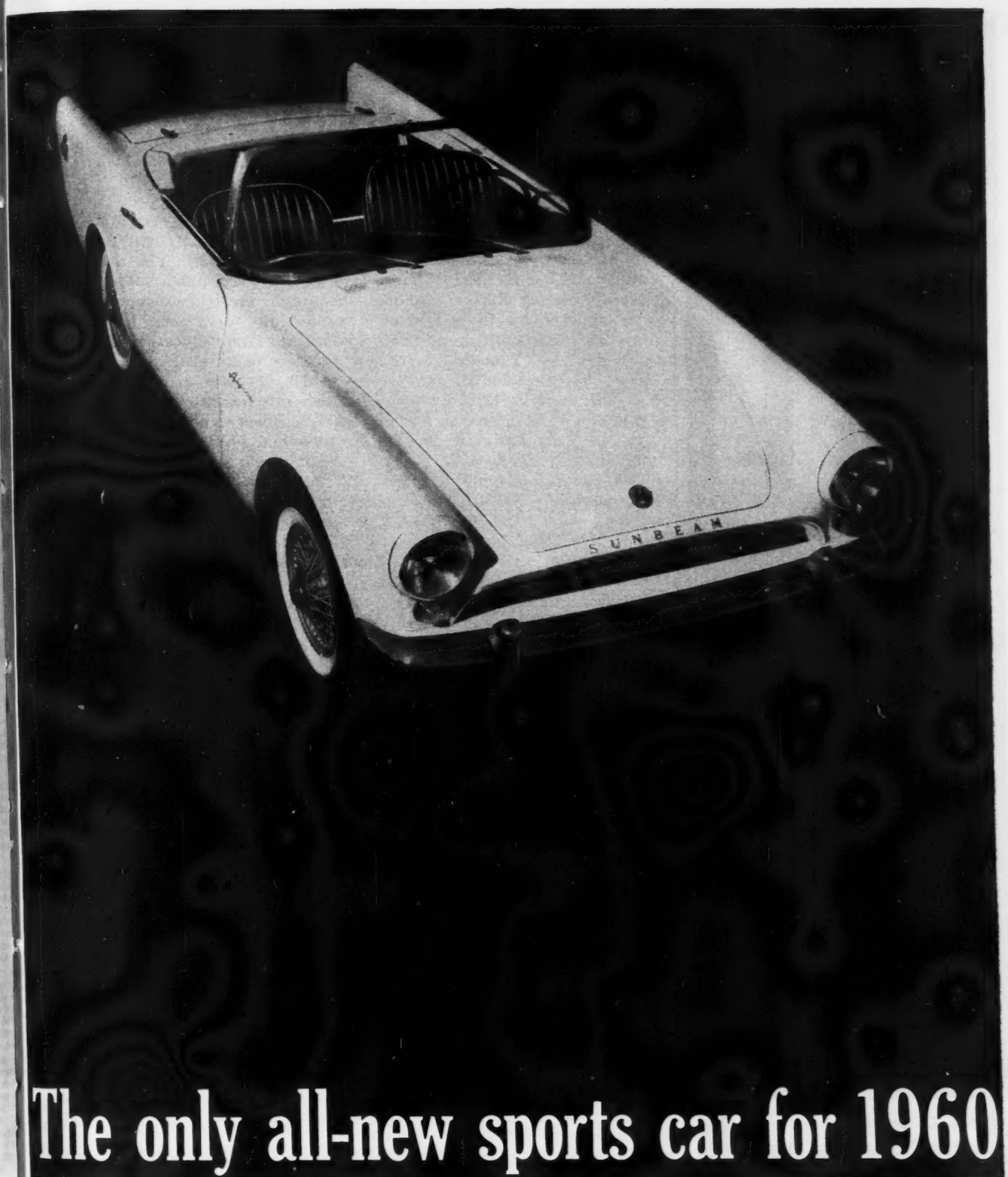

The only all-new sports car for 1960

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OBSERVATION AND OPINION

EVEN MORE POTENTIAL — What a wild animal that Ferrari Berlinetta is! It's a full-blooded, full-bore sports car that could only have come from Italy and, at that, only from the shops of Enzo Ferrari. The whole car is wonderful but the engine is a genuine work of art, without a doubt, as our Road Research Report concludes, the world's greatest automotive engine. Its tremendous abilities lead us to wonder why we've never heard of any specials being built around this powerplant. Granted it's expensive (and you don't find "totaled" Berlinettas in every junkyard), but so are many other imported and modified American engines used in sports-racing cars in this country. Ferrari builds his sports cars overstrong, to stand up to the rigors of long-distance racing, making them definitely on the heavy side for the sprint events that predominate here. Build a light space frame around a Testa Rossa V12, maybe equip it with solid axles at front and back for the smooth U.S. tracks, and you'd have a pretty impressive projectile. The type 250 V12 has another advantage to the special-builder too: it's so smooth and vibration-free compared to an in-line four or even to a V8 that it will be extremely easy on your frame tubes and welds. In case you want to start calculating weight distribution (while waiting for one of these coupes to wrap itself around a tree) the engine weighs 385 pounds.

If your thoughts turn to road cars, as ours did while driving this remarkably roadable Ferrari, you might be interested in the "ideal but practical" touring sports car concept the SCI staff came up with. It's a car that could actually be built, and we offer massed encouragement to anybody who'd like to build it. We'd use the Ferrari engine and transmission, tuned just as in the Berlinetta. For the frame and bodywork we turned to the Mercedes 300SL coupe, the competition edition with stiff springs and shocks and all-alloy body. The Mercedes scores for touring with its generally better driving position and interior layout, and of course its space frame is the ultimate in stiffness for its weight. To improve luggage room we'd graft on the rear frame section from a 300SL Roadster, which would give us the low-pivot swing axles too. Then we'd fit disc brakes all around, as developed by Dunlop and Jaguar and used on the Ferrari, and since in our opinion disc brakes and disc wheels are not wholly compatible, we'd use light-weight Borrani wire wheels. The final touch, so we could seal and forget the Mercedes's windows, could be air conditioning! How's *that* for a businessman's express?

VERY MUCH READY — As this is written, Ferry Porsche is making one of his periodic tours of America to keep up his engineering contacts and his familiarity with our marketing conditions. When asked about his 1961 Grand Prix plans, with special reference to the car you see dissected in our center spread this issue, he was most explicit. "We will definitely compete in Grand Prix racing next year," Porsche said. "Whether or not we use this same car depends on what the competition does. If Cooper, Lotus and others decide to continue with developments of their 1960 Formula 2 cars, we'll do the same. This should be adequate, since our Formula 2 Porsche has already proved equal to the British cars. If, on the other hand, they build entirely new and more powerful engines, we will follow suit — but only after they've done so. In this case we wouldn't be competitive during the first half of the season or so, but we would be later on."

SPICE OF LIFE — The automotive variety that marks SCI is beautifully illustrated this month in a remarkable selection of cutaway drawings. C. O. LaTourette has outdone himself with a magnificent drawing of the Formula 2 Porsche, and was able to reveal the cleverness of Pontiac's new Tempest as well. Tom Fornander's portrayal of the Ferrari keeps the Road Research Report standard high, and a new-comer to our pages, Gordon Bruce, strips the skin off The Chizler. Four cars: a racing car, sedan, sports car and dragster, all extremely exciting automobiles. That three of these are not sports cars accounts in part for the new line on this month's cover: "Magazine of Car and Driver".

— *Karl Ludvigsen*

What the well-dressed sports car driver should wear

(One of 10 winning tips to bag $25.00 in Ancient Age sports car idea contest!)

DR. SHELTON K. HINKLEY, ROCHESTER, N. Y.: Keep an old pair of socks with the feet cut off in the glove compartment. When you work in the motor compartment, slip the socks on over your wrists to protect your sleeves.

WILLIAM J. MALONEY, CHICAGO, ILL.: Cockpit cooling can be a problem with many sports cars. Aside from louvering the hood to let engine heat escape, the flexible ventilation ducts can be wrapped in aluminum foil to protect them from hot engine vapors. This keeps air cooler when entering vents in cockpit.

MANNY EISNER, BROOKLYN, N. Y.: When the trunk of my MG leaked, I sprinkled some talcum powder on the rubber sealing and then locked the trunk. When I opened it, I could see the areas where the trunk leaked because there was no powder on the trunk lid. These leak areas can be raised to meet the lid by placing the car jack in the trunk under the low spots, and jacking up these areas.

ROBERT H. HALL, FAYETTEVILLE, ARK.: If your tonneau cover is leaking along the zipper, apply paraffin from a block, rubbing it along the face of the zipper. The wax impregnates and seals the space between teeth quite effectively.

DENNIS THALMAN, SALT LAKE CITY, UTAH: Occasional painting of black-wall tire and tread with black tire dressing will strengthen the tires and increase their life.

TONY SHERIDAN, WEST VANCOUVER, B. C., CANADA: Simonize your windshield in the summer to keep it free of bugs.

TOM WINGETT, CHEYENNE, WYO.: A few drops of glycerin in the felt linings of your sliding side panels will keep plexiglass panes from freezing shut in cold weather.

W. R. ULRICH, ST. LOUIS, MO.: Dirty spark plugs can be cleaned by soaking them in household ammonia. They will emerge much cleaner than sandblasted ones. Ammonia loosens deposits and floats them off.

ERLING LARSEN, NORTHFIELD, MINN.: When travelling, pack your things in canvas and laundry bags for easy storage in the corners of your car, behind seats and around the spare tire.

LAWRENCE LAINO, SAN FRANCISCO, CALIF.: When the rain season starts, it pays to check the drain holes on the bottom of the doors. They often get plugged up with dirt, causing the doors to get partially filled with water. An ice pick will open the drain holes nicely.

AND HERE'S ANOTHER winning tip from the distillers of Ancient Age. Nothing has been spared to make Ancient Age the greatest bourbon of them all. We invite you to try it tonight.

If you can find a better bourbon... buy it!

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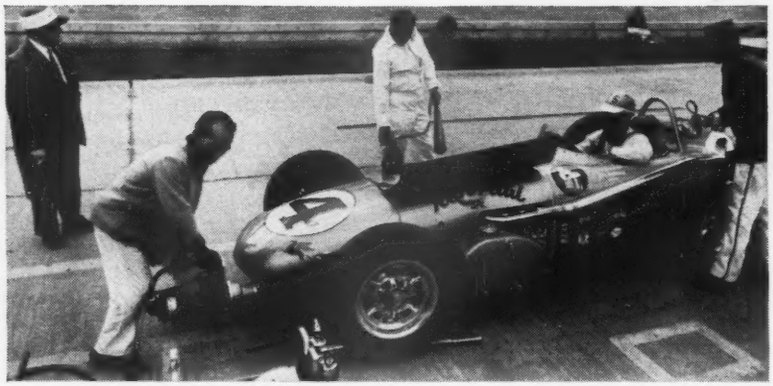
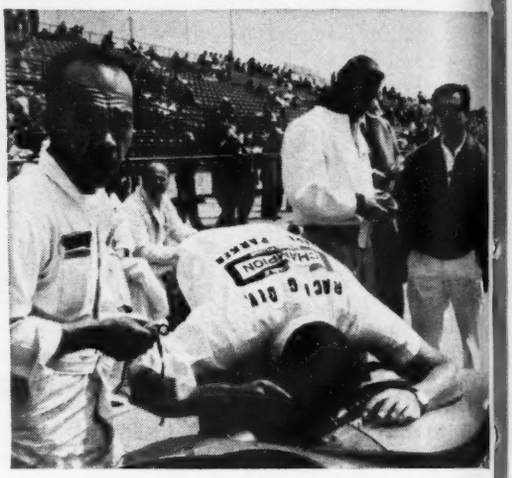
HERE'S A VIEW OF THE "500"....INCLUDING THE ALL-IMPORTANT TIME TRIALS...THAT THE GENERAL PUBLIC NEVER GETS.....

CHAMPION TAKES YOU "INSIDE INDIANAPOLIS"

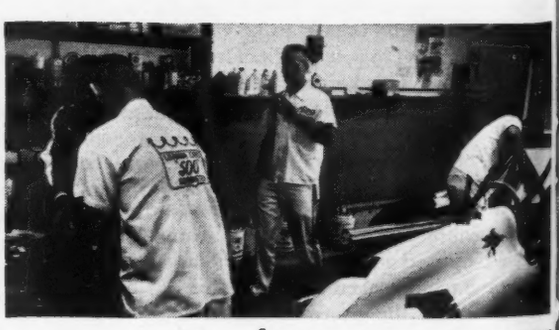


1. OUT ON THE PIT APRON you watch Jim Rathmann's Champion-sparked engine being started for a practice run, two days before time trials. Smoky Yunick, wearing the big black hat, was boss of Rathmann's pit operations during the race. Yunick is also a top mechanic in stock car racing.



2. STANDING BY JIM RATHMANN'S CAR the day before time trials start, you watch as his head mechanic, Chick Hirashima, waits for Champion Racing Engineer Earl Parker to check the plugs after a run. A visit to Indy shows you how much these engine experts rely on spark plug checks to get a better idea of what's going on inside their engines.

3. ON THE PIT APRON the first day of qualifications you feel like joining the applause for happy Chick Hirashima, running to congratulate Jim Rathmann on breaking track qualification records. For the second straight year, every car that qualified was Champion-sparked.

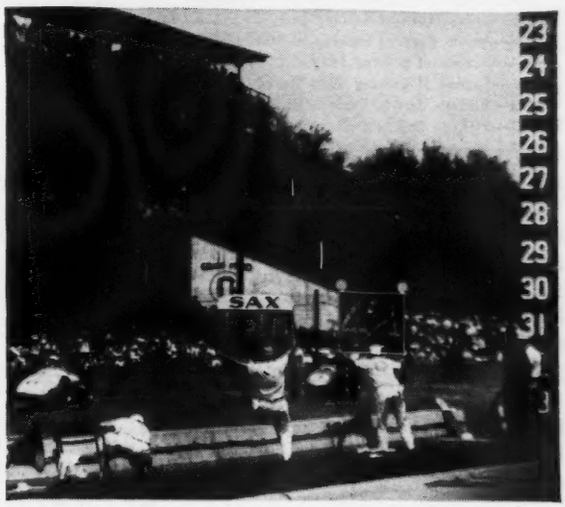


DEPENDABLE CHAMPION SPARK PLUGS

4. INSIDE RODGER WARD'S GARAGE early on race day morning, you see final preparations as Champion Racing Engineer Dick Jones (left) checks plugs with A. J. Watson, ace Indy car builder and head mechanic for Ward and Chuck Stevenson. Car is Ward's.

5. FROM THE TOWER you see rare sight as Ward and Rathmann, running 1-2, roar into the pits together on lap 148. In the most exciting duel ever seen at the Brickyard, Ward and Rathmann officially exchanged the lead 15 times in the last 78 laps before Rathmann's victory. Ward finished his pit stop first, waved to Rathmann as he drove out. Rathmann's crew chief at once stopped fueling, sent him in hot pursuit of Ward—and victory. It was the 10th time in the last 11 races that a Champion-sparked car won the "500."

6. FROM DOWN THE PIT APRON you see Rookie-of-the-Year Jim Hurtubise get fast pit service, his car raised on a unique jacking platform. Hurtubise rocked the Speedway with a fantastic 149.601 mph lap during qualifications—and a 4-lap average of 149.056 mph!



7. FROM THE PIT WALL, early in the race, you see Eddie Sachs leading in No. 6, and Rathmann in No. 4, being signaled by their pit crews. Sachs, Rathmann and Ward, the front row starters, all race sports cars as well as the big Indianapolis speedsters.

DETROIT NEWSLETTER

by Mike Davis

As you read this, Detroit's auto plants are beginning to grind out their 1961 models in time for introduction at the National Auto Show in the Motor City, October 16-25.

The annual model change has been the mainstay of the U.S. auto industry ever since General Motors conceived it in the 1920s. In recent years, annual change has come in for a round of criticism.

GM's president John F. Gordon had some thoughts on the subject recently, and they are worth quoting—

"We make changes, not for the sake of change, but for the sake of progress. Let me document that statement:

"Point One—The deadline presented by the annual model change and the knowledge that competitors are making changes too, spurs our engineers and designers to greater accomplishment.

"Point Two—The annual model change generates sufficient additional sales to pay for itself. It does not increase the cost of the product. If we did not bring out a new and better product each Fall, volume would fall off, unit costs would increase and employment would be reduced.

"Point Three—The annual model change makes used cars available before they are worn out, and twice as many people buy used cars as new ones. When a man buys a new car, the old one he trades in provides the only kind of private transportation that many people can afford to buy.

"Point Four—The annual model change has enabled the automobile to create, both directly and indirectly, thousands of new jobs, to enrich our standard of living in many ways and to change the entire pattern of our daily lives."

EXECUTIVE INDIGESTION

If Bill Newberg's elevation to president of Chrysler in April was a surprise to some and logical to others, his resignation at the end of June floored one and all.

Best guess at press time: Tex Colbert still runs Chrysler, old friendships notwithstanding, and there have been disagreements over personnel and purchasing policies. We'll bet there will be more changes at Highland Park before the end of 1960.

CORVAIR CONVERTIBLE?

We did a double-take the other day when we drove by a suburban Detroit Chevrolet dealer and spotted a Corvair convertible in the showroom.

Had Chevrolet introduced a new—and exciting—body style without the usual press notices? Was this an experimental model which had slipped out?

Nope. Investigation turned up the fact that a Chevy dealer in Vassar, Michigan—Ray MacGillivray—is converting Corvair 500, 700 and Monza coupes to ragtops. He cuts off the steel top, adds additional stress members to the underbody and a removable window post, and installs a manually-operated convertible top. The price? MacGillivray says about $150 over the regular price of a coupe.

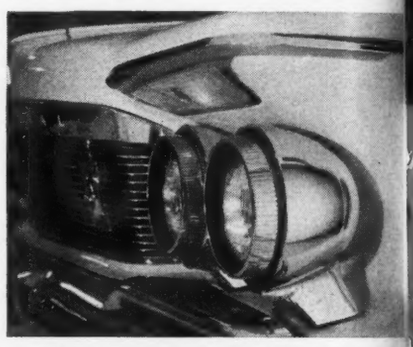
A drawback to this custom job might be that Chevrolet would be hesitant to honor its warranty if the converted convertible crumples.

MORE SLIDING ROOFS

Thunderbird scored a first among U.S. automakers this year when it introduced the sunroof as an extra-cost option. The sliding steel or canvas top slot is a common and popular variation in European cars, but the cost in the U.S. for the alteration ($200 up) is almost prohibitive.

However, the German firm which sold Ford Motor Co. on the idea has also recently slipped its foot inside GM design studios. At least two Corvairs with opening roofs—one canvas and one steel—are being driven around by GM stylists.

Let's cross our fingers and hope GM makes a sunroof available on the Monza.



A backward glance for the forward look is the thought behind use of "classic"-styled headlamps mounted on the 1961 Chrysler Imperial.

THE NEW NAMEPLATES

In spite of our best spy work, GM pulled a fast one with names of its three new compacts: Pontiac Tempest, Buick Special and Oldsmobile F-85. The Invader tag which everyone had placed on the small Buick evidently will go to a Canada-only compact which GM will introduce across the border this Fall.

It's like we said last month—names are practically the last things that can change. The Dodge compact will be named, as we predicted, the Lancer.

SMALL TRUCKS

If you can imagine a Volkswagen Microbus with Chevrolet panel truck styling, you've nailed Chevy's new compact trucks. The configuration is almost identical—double doors on the center right side, driver over front axle, boxy look.

The pick-up Corvair also has a side-loading gate, and the front looks like a Willys cab-over. Powerplant is likely to be the 95-horsepower job.

Ford, in the meantime, has brought out its own compact truck—not a Ranchero, which they did in March—but a cab-forward design, with wheelbase as short as 96 inches and the Falcon engine as an option. It replaces, or augments, the old Ford multi-stop delivery. (*Continued on page 10*)

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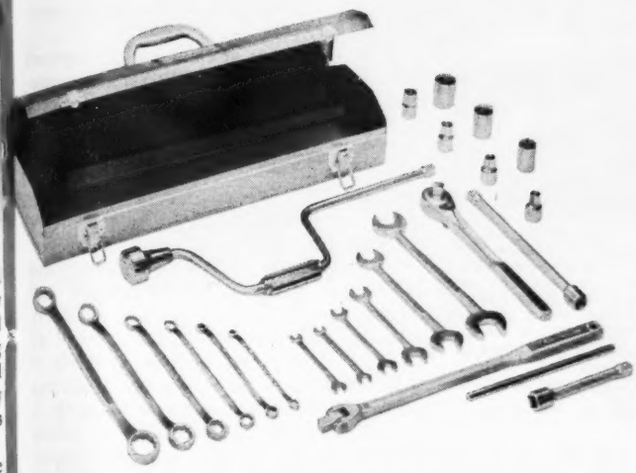

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TIME TO TALK TOPS . . .

or May This House Be Safe From 1937 Jaguars by Marion Weber

Hi, there! People seldom question anything printed in this literary effort except the photos. Now they're asking, "Who is the baby?" And, "What is the insignia on the kid's coveralls?"

The child is MG Mitten's youngest customer and the insignia is a TR jacket patch ($1.00). She came in to the store, drank her free Coke and hated to leave without buying something . . . so we sold her the patch, that's all.

Now. Let's sell some tops. You hipsters know how expensive it is to have your convertible top replaced? **Very**, that's how. Unless you dig the fact that you can do it yourself. With ordinary, average ability you can install one of our tailored and engineered-for-home-installation tops. (I can, even) And, take a nice weekend trip on the savings. Look:

MG TC TD TF TOPS—$29.95

These are 3-ply de Luxe fabric, 18 month written guarantee tops with big rear window.

Full instructions and all hardware go with each kit. No special tools are needed. Colors include black, tan or white. Please specify year of MG model when ordering. Again:

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AUSTIN HEALEY	1957-59 100-6 2 seater
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AUSTIN HEALEY SPRITE	1958-59 (9 studs on windshield)
AUSTIN HEALEY SPRITE	1957-60 (2 studs & metal strip)
HILLMAN	1950-56 Convertible
JAGUAR XK 120	1953-54 Roadster (Chassis No. 673-396 on)
JAGUAR XK 120	1950-54 Convertible
JAGUAR XK 140	1955-57 Roadster
JAGUAR XK 150	1958 Roadster
MERCEDES-BENZ	1956-59 190SL
MERCEDES-BENZ	1959-60 300SL Roadster
NASH	1954-59 Metropolitan
PORSCHE	1955-59 Speedster
SIMCA	1957-59 Aronde
SINGER	1959 Gazelle Conv.
SUNBEAM RAPIER	1958-59 Convertible
TRIUMPH	1954-55 TR-2
TRIUMPH	1956-59 TR-3
VOLKSWAGEN	1947-55 Sunroof (to chassis 10929-745)
VOLKSWAGEN	1947-57 Convertible (to chassis 39038)
VOLKSWAGEN	1957-59 Convertible (from chassis 39039)
VOLKSWAGEN	1958-59 Karmann Ghia Conv.

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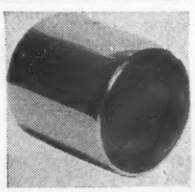

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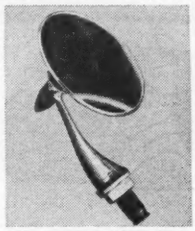

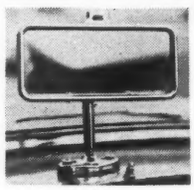

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WIGGLE FLASH can keep you safe during highway stop. Brilliant reflecting surface catches light, flexible base makes it flash. Just drop on pavement. Get two $1.00 ea. $1.85 pr.

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Now that your car is sparkling in the sunlight, protect its lustre and interior (not to mention top, tonneau and accessories) by keeping it covered with a tailored lightweight cover. Thousands of happy owners have discovered that an MG Mitten, used judiciously, can bring interesting monetary rewards at trade-in-time. Select from the list below or write for prices on specific car covers.

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Jaguar Jacket (120) Vest For Volkswagen Renault Romper (Dauphine) Alfa Apron (Coupe) Ghia Gown Ferrari Frock (250 GT) Lancia Lap Robe Porsche Parka AC Apron	$22.95	$29.50
Corvette-Corvair Cap Jaguar Jacket (140-150 3.4) Mercedes Muff (190, 300SL, 220, 300 Sedan) (Specify year, model) Volvo Vest	$27.95	$32.50

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(Continued from page 8)

Still no word from Chrysler on a small truck, although one was designed in the group with the Valiant and Lancer.

The Corvair station wagon, we understand, will not resemble the Microbus, but will have a more conventional wagon body, with some hood (or should we call it front deck?) evident.

ODDS 'N' ENDS

Although the Chrysler 300-F has had good sales success this year, the optional four-speed gearbox has been discontinued. There was not enough demand for the stick-shift to justify tooling, importation was impractical, and performance was disappointing. Oh well, maybe some other time.

Chrysler has unveiled a 140-bhp 450-pound gas turbine for automotive use, said to provide acceleration and fuel economy comparable to piston engines. The regenerative turbine, smaller and lighter than previous Chrysler attempts, makes use of their new low-cost alloying materials. The Corporation is sticking to its estimate of 1966 as the latest probable date for turbine use in production vehicles. It made the prediction in 1956, when a turbine-powered Plymouth made a cross-country run. Chrysler's executive engineer in charge of research for its engineering division, George J. Huebner Jr., said " . . . we believe we are still well within that ten-year prediction." He stressed, however, that the prediction was based on an engineering basis alone. He indicated the first likely large-scale market would be the Armed Forces, particularly the Army.

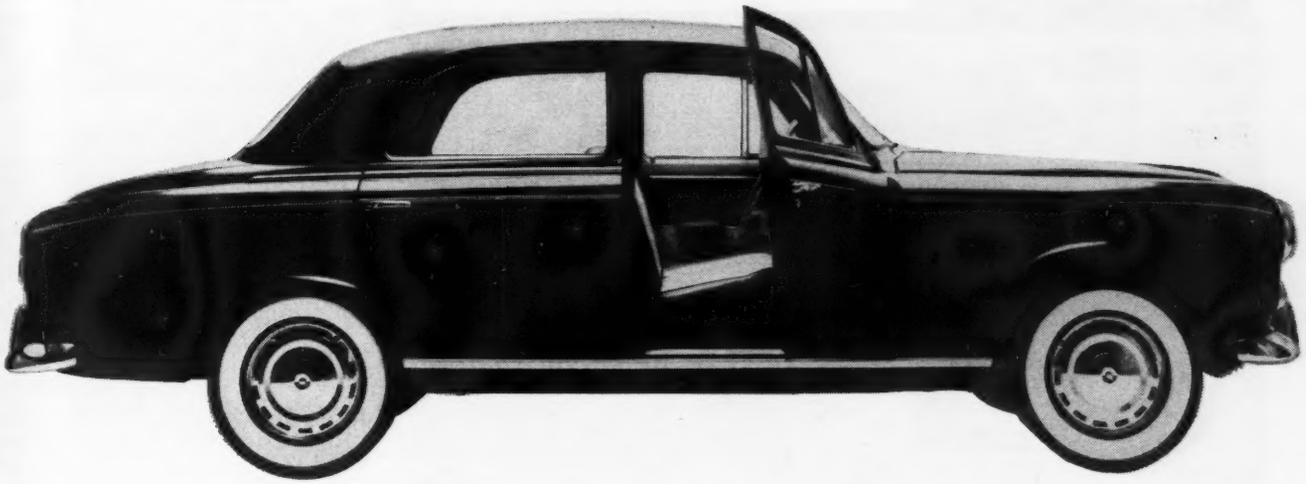
On another scene at Chrysler, it's reported the Corporation has some 10,000 aluminum-block slant-sixes out for trial in taxi fleets, company cars and employes' cars.

SCI salutes the American Association for Automotive Medicine which will hold its third annual convention Sept. 19 and 20 in Dearborn, Mich. The physicians organized in the interest of reducing the staggering annual toll of highway deaths and maimings. Most of the organizers had terms as race course medicos and felt safety measures must be devised for drivers of all cars on all roadways. Individual members have served as advisors to state legislatures and law enforcement agencies in addition to such activities as devising and testing safety equipment. Their session will feature a roundup of the past year's activities. Physicians interested in the organization, recognized by the American Medical Association, should contact the secretary, Dr. George G. Snively, care of County Hospital, Sacramento, California.

George Romney, American Motors president, who has achieved something resembling sooth-sayer status, predicts that by the end of next year compact cars will dominate the American auto market—three years earlier than he had originally estimated. He said the compacts, which are now taking about 25 percent of the market, will increase their penetration to the tune of more than 50 percent by the end of 1961, and by the end of 1963 should be accounting for 65 to 70 percent of sales.

Latest word from Wisconsin is that the 100-inch-wheelbase Rambler American is in for substantial body change; the 108-inch model gets the new engine. —*MD*

How to tell a Peugeot 403



from almost any other car!

Peugeot is the one that looks like a car. Its styling is conservative: no fins; no excessive trim; no strange shapes. Peugeot drives like a car. It is very alert, very responsive. Owners say it gives them a long-lost sense of rapport with the road. ("You drive this car—it does not drive you.") These accessories are *included* in the price: sliding sunroof, whitewall or Michelin X tires, 4-speed synchromesh transmission, heater-defroster, padded dashboard, cloth or leatherette upholstery, reclining seats, electric clock, windshield washers, trip mileage counter, wheel trim rings, arm rests, dual-tone horn, two padded sun visors, stainless steel bumpers and trim and outside rear-view mirror.

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LETTERS

SPORTS CARS VS. DETROIT

In the August Letters column, we printed a letter from W. R. Mead III, of Lynchburg, Va., dealing with the perennial "sports cars vs. Detroit" theme and invited readers to comment. Mr. Mead maintained that after witnessing a race between a Plymouth Fury and an Austin Healey 3000 on a twisty road there is no longer any advantage in buying a sports car. Some readers' comments included:

. . . I hope Mr. W. R. Mead III is now driving Detroit Iron which he deserves. It will depreciate faster than he can pay for it and keep him broke buying gas. There's no feeling like the pride of ownership one feels with a sports car . . .

Miss M. R. Novak
(a proud Alfa owner)
Jessups, Maryland

. . . I have had 1956 and 1957 Furys and still have the latter in addition to a 1958 Porsche 1600. The Fury will not take curves at the same speed — by some 10-15 mph — as my Porsche. Maybe I have lost some of my touch after 40 years of driving, but I still know a spinout and a tire scream and when to let up when you have exceeded the critical point. My only comment to Mr. Mead is don't underrate the little ones. He has only to drive a Fury with a true sports car . . . over the passes from Lake Como to Vittorio Veneto in Italy to find out . . . and I can assure him he will wish he had only to use the Porsche for another trip like that . . .

Sandford S. Cole
Hightstown, New Jersey

. . . I owned a '57 Plymouth (not a Fury) and drove it on a twisty canyon road. Now I have a Saab 93B and the time it takes me . . . on the twisty road is just about the same. The advantage in having the Saab is not only the ease with which I can drive it . . . and not only the fact that it gets exactly twice the gas mileage of the Plymouth but the good feeling I have when I contemplate all the excess metalwork, fins and "styling" I am not carrying with me . . .

Thomas J. Lyon
Providence, Utah

. . . I don't know about Austin-Healeys and Plymouths but I do know about Porsches and Thunderbirds. I had no trouble leaving a four-passenger Thunderbird in the mountains around Roanoke, Va. in my 1958 Porsche 1600 Normal Speedster . . . I have never had any trouble finding parts I have needed. The car has never left me stranded which is more than I can say for the family Cadillac (also 1958) which covered half the annual mileage. And please, Mr. Mead III, don't be afraid that your letter will hurt the sports car business. I am still going to take delivery of a new Porsche Super Coupe . .

Jan Mel Poller
Miami Beach, Florida

. . . Why even consider buying a sports car? I feel that three words can sum up most of the feeling why: Safety, Sport and Status. Speed, being secondary to most, is something anyone can achieve with varying degrees of money. I suggest that Mr. Mead . . . stays with the car that suits him most. I have enjoyed owning a 140 MC Jag, an Alfa Spider and a brand new, white, Caravelle . . .

Ben P. Millspaugh
Enid, Oklahoma

. . . I have compiled a table of comparisons listing pounds per horsepower for various cars: Fury, 12.37; Austin Healey 3000, 18.4; Ferrari 250/GT, 11.25; Aston Martin DB4, 10.9 and Maserati 3500 GT, 13.8. How would the Plymouth shape up with these cars of equal lbs/hp instead of the milder Healey? Very poorly would be the only answer. I dare say these cars could leave *any* stock production American car, bar none, in a road race. If they could not, then the world's road race courses would be dominated by American sedans.

Paul M. Dicker
Sarasota, Florida

HIGHWAY MESS?

Robert Gorman's article "You're Paying for These New Interstate Highways" in August SCI presented, in my view, a rather sympathetic and optimistic picture of the interstate highway system. He does not detail many of the difficulties inherent in the present system, e. g., lack of provisions for highway maintenance after they are built, or for adequate service and rest areas for the motorist. I would like to suggest as a worthwhile complement to Gorman's, (a story by) Daniel P. Moynihan, "New Roads and Urban Chaos," THE REPORTER, April 14, 1959 . . . . These two should give the interested reader a perspective on what began as a creditable idea, but what has already wound up as a *mess.*

J. R. Newbrough
Cambridge, Massachusetts

THAT WAS A DUESIE!

In the August issue, Griff Borgeson in his article "Project Time Machine," refers to the " . . . dry lakes duel between Gary Cooper's Duesenberg SJ and Zeppo Marx's Mercedes-Benz SS."

Checking with J. L. Elbert's authoritative book "Duesenberg, The Mightiest American Motorcar," who in turn gives his source as the January 1933 issue of MoToR magazine, a discrepancy comes to light: the Duesenberg belonged to Phil Berg and was an *un*-supercharged phaeton.

It seems to me it is also worth mentioning that in this 15-mile race the Mercedes, *mit kompressor,* came in four miles behind the Duesie, *mit out kompressor.*

Robert E. Howe
Grants Pass, Oregon

NOT SO COOL FORMULA 1

I say old Chap! In the Lotus Formula 1 (SCI June '60) you have a portable barbecue with the bloody petrol tanks in the driver's lap. One thump on the nose and he is done to a turn! At least give the lad a sporting chance by using collapsable tanks.

Yours for safety,
Joe McBride
Stockton, California

TECHNOTES

TACH TROUBLES

Last year I bought an American-made electronic rev counter which I installed in my Peugeot. This year I sold the Peugeot and transferred the instrument to a Citroën ID19. It does not function properly, refusing to indicate over 2000 rpm regardless of engine speed. The Peugeot had a 12-volt system and no suppressor. The Citroën has a 6-volt system and a suppressor.

J. H. Gilroy
SHAPE APO 55
New York, New York

The source of your rev-counter trouble lies in the change from a 12-volt system to the Citroën's 6-volt system. An electronic tach is designed to function on a specific voltage system with an engine of a given number of cylinders. An ignition suppressor should have no effect on the tach. Since you have switched from one four-cylinder engine to another, it may be possible to revise the circuitry of the tach to operate on half its designed voltage.

0-60; TIRE PRESSURES

1. Which is a better indication of a car's performance capabilities: the 0-60 time or standing quarter-mile time? Does one indicate a different facet of acceleration from the other?
2. I am confused about proper tire pressures for the best cornering. Using the manufacturer's figure as a base, is it better to go above or below to obtain better cornering, assuming we are not concerned with heat build-up?

John T. Mayo
Yonkers, New York

1. Actually neither figure in itself is a good indication of a car's performance. A better evaluation results from comparing the 0-60 time with the standing quarter-mile time and speed at the end of the quarter mile. The twin cam MGA covers the quarter in 18.3 seconds and reaches 80 mph. However, the 0-60 time is only 10 seconds. Typical of smaller displacement cars, the rate of acceleration decreases noticeably above 60 mph. For comparison, the Aston Martin DB4 does the standing quarter in 16.1 seconds reaching 94 mph, while 0-60 takes 7.6 seconds.

2. Raising the tire pressure 10 percent above recommended inflation gives an 11 percent increase in the cornering power of the tire, while a 20 percent higher pressure gives some 17 percent better cornering power. The limiting factor is either excessive tire hop or passenger discomfort depending upon the suspension system of the car. Cornering power of underinflated tires decreases *on the order of 9 percent for each reduction of 10 percent in tire pressure. For tires with a steel mesh or wire-reinforced tread (Michelin X, etc.) increased tire pressures are not nearly so beneficial as tread pattern distortion is reduced by the reinforcing material.*

SPEEDOMETER ERROR

I am in need of some answers to the following questions:

1. Are speedometers and trip mileage figures on stock cars such as Plymouth, Ford, Chevrolet, Buick, Chrysler, etc., generally fast or slow?
2. How much are they off and is there any consistency in the error?
3. Can you give me some figures to illustrate this?

P. T. Gillis
Independence, Kansas

Speedometers tend to be progressively optimistic as speed increases. The speedometer is a magnetically-driven device acting against the force of a return spring. Only quality control of the highest order will permit making a very accurate (and expensive) instrument. The figures below are an average compiled from tests of seven American production cars including some of those mentioned.

Indicated speed 20, true speed 19; 30/29.7; 40/39.2; 50/48.8; 60/58.6; 70/68.4 and 80/76.5

The odometer or trip mileage counter is gear driven. Its error is constant and due in part to tire deformation and wheel slippage. The average odometer optimism for the group of cars mentioned above is 3.32 percent.

GEARING A SPRITE

I have an Austin-Healey Sprite which I have been racing here in the East (mostly short courses). The engine has been modified as follows: cam, increased compression, porting, etc. The engine will reach 6500 rpm in the first three gears, but won't exceed 5000 rpm (about 85 mph) in top gear.

I seem to run out of revs very quickly in first and second and acceleration in third is poor below 4000 rpm. I am not looking for top speed, but want better performance in first and second and a gearing change to bring third gear closer to second. Acceleration from 0 to 60 or 70 is what I need.

My gear ratios are: first, 3.627; second, 2.374; third, 1.412 and fourth, 1.0. The rear axle ratio is 4.22:1 and the engine produces 43 bhp at 5200 rpm and 52 lb-ft of torque at 3300 rpm.

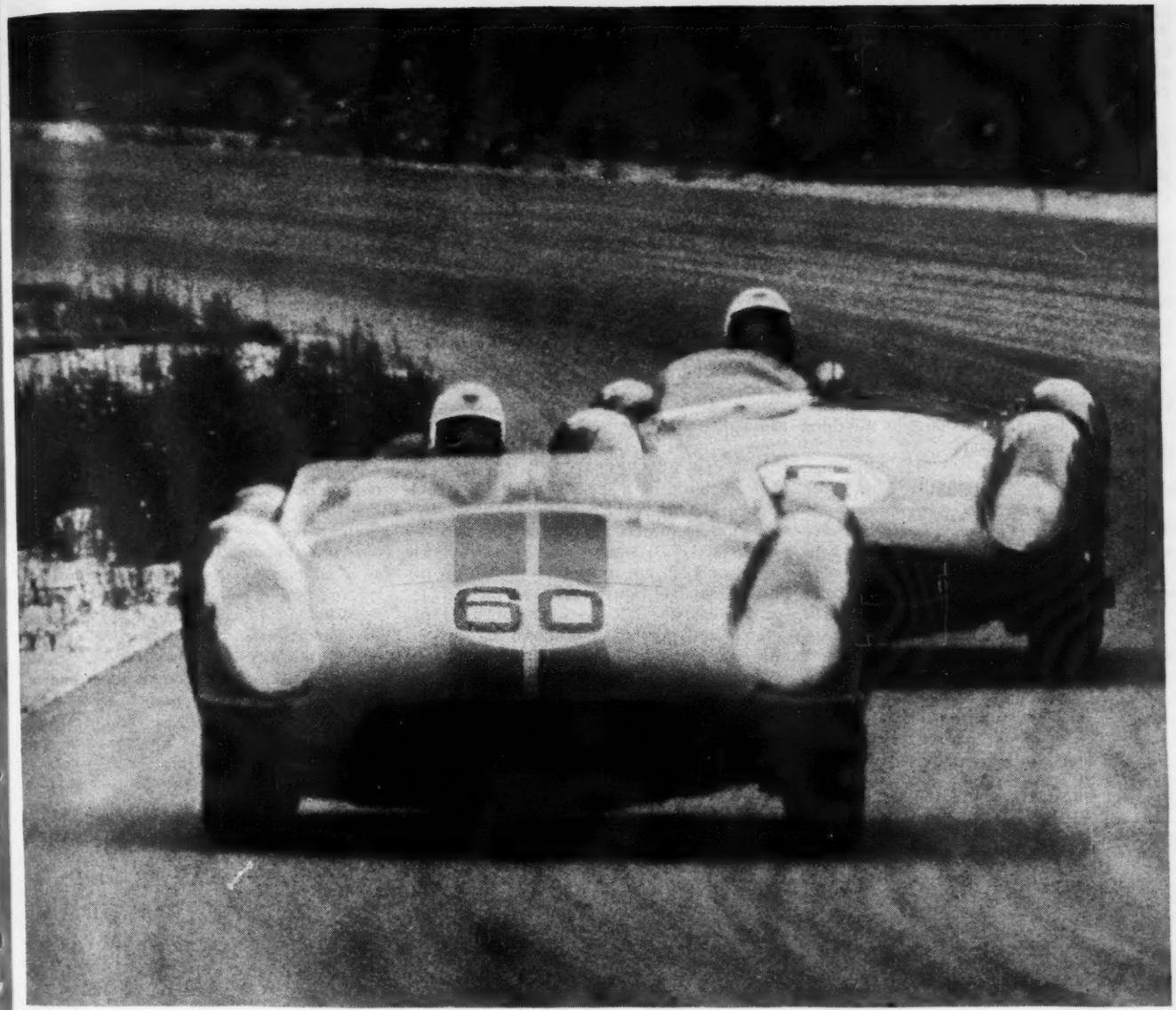
Fred A. Drabenstadt
Lebanon, Pennsylvania

The brake horsepower and torque figures you list are for the stock Sprite engine. Your modifications should be providing about 52 to 54 bhp at 5600 rpm and some 55/57 lb-ft of torque at 3500 rpm. This is fairly close to the figures for the Sebring car which runs F-Production at SCCA races.

The best solution for your acceleration troubles is to replace your present gears with the optional close-ratio set and change your rear axle ratio to 4.55:1. This combination would take full advantage of the increased brake horsepower and the new gear sets are available from your Austin-Healey dealer as regular production options.

Using a 6500 rpm limit, the maximum speed in each gear should be: first, 30 mph; second, 47 mph; third, 68 mph and a top speed of 87-89 mph. Your 0-60 time with the revised gearing should be about 13 seconds, while the 0-70 time would be on the order of 21 seconds. An alternative would be to change the gearbox ratios and

(Continued on page 16)



WALT HANSGEN WINS '59 SCCA NATIONAL CHAMPIONSHIP ON FIRESTONES

And that's his fourth in a row in class C-modified, hottest of all. He also shared the *Sports Illustrated* choice for outstanding sports car driver of the year. Walt has used Firestone tires for years on the track and highway alike. He knows Firestone's winning ways in racing help build many improvements into passenger car tires. Two such advantages are Firestone Rubber-X*, longest-wearing rubber ever used in Firestone tires, and Firestone Safety-Fortified cord. You get both in the great new Firestone Nylon "500", plus a revolutionary one-piece molded Power Tread that puts thousands more center action traction edges to work where they count most. This added road grip increases tread life by as much as 35%. Buy a set today, on convenient terms if you wish, at your nearby Firestone Dealer or Store.

Quiet-riding, long-wearing Firestone Rubber-X-101 now in all Nylon "500"® tires.

Firestone

SPEEDWAY-PROVED FOR YOUR TURNPIKE SAFETY

(Continued from page 14)

keep the 4.22:1 rear axle. This would increase your acceleration times, but allow a higher speed in each gear by about 7 percent.

MOG MODS

I recently became the proud owner of a rather sick 1954 Morgan Plus 4. Perhaps you can suggest a method of improving the modest 68 bhp of the 6.7-to-one, single-carb Standard Vanguard engine.

My thought was to fit a TR-2 or 3 manifold system to the Vanguard head to improve breathing. I felt the head might be milled to raise the compression ratio and finally that the larger exhaust valves might be fitted after enlarging the seats and installing stiffer valve springs. Apparently there are no factory produced options along these lines for the Vanguard, and nobody has been able to suggest anything short of an engine swap.

Jay Silverman
Peekskill, New York

Although the TR-series engine was developed from the Vanguard unit, extensive design changes during the process have limited the number of parts common to both engines. The cylinder heads are not interchangeable, nor are the manifolds, but the TR camshaft, crankshaft and connecting rods will fit the Vanguard block.

Modifying the present manifolds or fabricating new ones would help breathing, and matching and polishing the ports for their full length would round out the job. The TR exhaust valves are 1 9/16-inch diameter compared to the Vanguard's 1½ diameter, so the gain would be marginal considering the expense. Fitting stiffer valve springs would be advisable if the TR cam is used. Milling the cylinder head would be beneficial, but a compression ratio of 7.8 to one is the maximum advisable. Design of the head fastening studs on the Vanguard block permits some lifting of the head when a higher compression engine is run at high rpm.

These modifications should yield an additional 15 to 18 bhp without engine reliability being decreased very much. The cost however, would be rather high, even if much of the work was done at home.

By comparison a complete engine swap has several advantages. The TR-3 engine produces 100 bhp at 5000 rpm in stock form and spare parts are readily available. The external similarity of the two engines means very few accessory and mounting changes would be required in the engine compartment.

VERY SPECIAL TRIUMPH

I am building a special using TR-3 components. This is for fun, not (supposedly) for chasing Masers and Lotus 17's. A Shorrock (MG-TD) blower and TD rear axle (4.88 or 5.12) are available and within my limited budget. Questions:

1. Would the TR rods, bearings, crank, clutch and gearbox stand blowing, assuming hard driving but competent use of clutch and gears?
2. How much would static balancing and frequent replacement of rod bearings help?
3. Suggested rev limits, blown and unblown, assuming static balance job.
4. Will the TD axle readily accept the increased power?

Incidentally, I want the TD axle for wider tread and my overdrive will permit sufficient top and cruising speeds.

Robert A. Mitchell
Philadelphia, Pennsylvania

Fundamentally, a supercharger is an air pump designed to deliver a given volume of air at specified pressure when turned at constant rpm. The Shorrock you plan on using was designed for the 1250 cc TD engine. To provide a sufficient volume of fuel-air mixture for the 1991 cc TR engine and still maintain adequate pressure, the blower must be turned at higher rpm than originally intended. The Shorrock is a sliding vane design like the Judson, and higher revs will result in reduced vane life. Considerable research in selecting proper drive pulleys and the proper carburetor venturi would be imperative.

The TR-3 engine components will stand blowing very well particularly if the static balance job you mention is properly done. For longer engine life and reliability, the present red line on the tach should be observed. Caution must be exercised here, as a balanced engine is much more free-revving and reaches peak rpm very quickly. A balanced engine with a proper blower installation will exceed the red line more easily, but this practice is not recommended.

The MG-TD rear axle should stand the increased loads well enough if it is not abused. The 4.88 ratio is the best choice for use with the TR-3 gearbox and overdrive. Here again, some research is needed in matching parts to permit use of either TR or MG wheels at both front and rear.

racing and sports car accessories by HAAN

IMPORTED ITALIAN
Sala-Sport
RACING & DRIVING SUITS

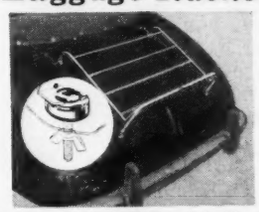
COLORS: White, Grey, French Racing Blue, Red or Black.

ONE-PIECE SUIT **$15.95 ppd.**

These original Italian racing suits are colorful and distinctive. Preferred throughout Europe for comfort and utility. Excellent for races and rallies. Features elastic gathered wrists, waists and ankles. Mandarin collar. Roomy pockets with heavy duty zipper closures. Tailored washable poplin fabric. Available in above colors. Men's sizes only: 36, 38, 40, 42, 44.

TWO-PIECE
RACING SUIT
(Pants $7.95
Jacket $9.95)
$16.95 ppd.

amco DEMOUNTABLE
Luggage Racks



For all sports cars (except Porsche). The utility of a permanent rack, yet removes in seconds leaving a clean rear deck with four chrome buttons at mounting points (see circle insert).

$26.95 ppd.

amco UNIVERSAL DETACHABLE
Luggage Racks **$22.95 ppd.**
(not shown)

SIX STRAND
Luggage Spider for securing luggage to rack. Covered elasticized cables with steel hooks.
$2.95 ppd.

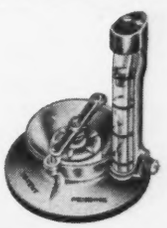
RAYDYOT

FIA APPROVED BRITISH MADE
Racing Mirrors

$5.95 ea. ppd.

Used as original equipment by the leading racing car manufacturers including Aston-Martin, Cooper, Lotus, Vanwall, etc. Shatterproof mirror in your choice of flat or convex glass mounted in streamlined spun aluminum cone housing. Wt. 5¾ oz. Adjustable base with positive locking device. Recommended for cowl mounting.

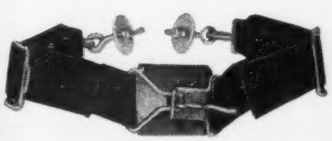
UNI-SYN
Multiple Carburetor Synchronizer



Synchronizes all multiple carburetors to maximum horsepower and economy. Balances side-draft and down-draft carburetors accurately without regard to position. Scientifically engineered. For all carburetors except four throat.

$9.95 ea. ppd.

COMPETITION
Seat Belts



Manufactured to meet SCCA specifications. Identical to U. S. Air Force with exception of snap ends to slip into your eyebolts. Quick release buckle. All brand new nylon webbing and stitching. Available in black only. Belt width: 3".

$16.95 ppd.

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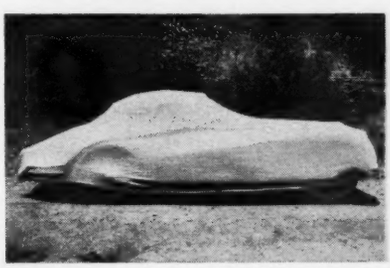
Custom Car Covers



Protect your car against dew, salt air, dust, etc. Specifically styled for individual make, model and year car. Cover is of sturdy silicone-treated fabric; vat-dyed, color-fast, washable, mildew and water repellent. Double pre-shrunk to retain appearance and proper fit. Elastic at both ends of car cover assures contoured fit.

State model, make and year car.

Alfa, AH, Sprite, Berkeley, Fiat Convertible, Metro, MG/TC-TD-TF-A, TR **$22.95**

Ghia, Porsche, VW **$27.95**

Corvette, Corvair, Fiat Sed., Falcon, T-Bird, Hillman, Jaguar XK-120-XK-140-XK-150, Mercedes, Morris, Opel, Renault, Sunbeam, Volvo. **$31.95**

HEAVY DUTY ALL RUBBER TWO-TONE
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$7.00 per pr. ppd. **$3.50** each ppd.

With name of your car molded in rubber. You will wear heel marks completely through the carpeting of your car within three or four months if you do not protect it. High heels on passenger side are particularly destructive. Choice of colors: Red, Black, Blue, Green. STATE MAKE OF CAR. For: Mercedes, MGA, MG, Fiat, Sprite, Triumph, Renault, Corvette, T-Bird, Alfa, Porsche, Austin-Healey, Hillman, Jaguar, Aston, RR, Morris, Morgan.

BELL "500TX" RACING
Crash Helmet

Approved by all racing associations. New energy absorbing non-resilient liner as approved by the Snell Fund Study. Meets all requirements in this study conducted by Geo. G. Snively, M.D. in first comprehensive racing crash helmet test ever made in U.S. Sizes: 6¾" through 7½".

Helmet with visor, $38.50 ppd., less visor $37.00 ppd.

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Driving Gloves

Sala-Sport **Full Fingered Gloves** per pr. ppd. **$7.95**

Sala-Sport **Shorty Gloves** per pr. ppd. **$7.50**

OFTEN IMITATED...NEVER DUPLICATED!
IMPORTED ITALIAN Sala-Sport gloves feature NON-SLIP GRIP. In skin-soft Italian leather, well ventilated, double leather palms. Four distinctive styles (except Shorties) in all sizes, including very small and very large; your choice of all black; tan and natural brown; white leather back and tan palm; knit back and brown palm. SHORTIES in knit back and brown palm only. Sizes: 6½-10 inclusive for ladies and gentlemen.

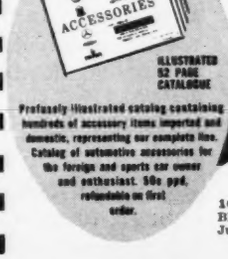
BELL "500TX"
Bubble Shields

Made of non-inflammable plastic. Are streamlined and shatter resistant. Tested at over 200 mph and gives undistorted vision.

	SNAP ON	FLIP* UP
CLEAR BUBBLE SHIELD	$4.95 ppd.	$7.95 ppd.
CLEAR WITH SUNSHADE	5.50 ppd.	8.50 ppd.
TINTED BUBBLE SHIELD...	5.50 ppd.	8.50 ppd.
TINTED WITH SUNSHADE..	5.95 ppd.	8.95 ppd.

*Flip Up model comes in two sizes: SMALL, for sizes up to and including size 7; LARGE for sizes 7⅛ and larger.

FLAME PROOFING $1.50 per pkg. (add 25¢ postage). Flame proof your cotton, silk, linen or wool suit with "Official Flame-Proof Chemical's" No. 55. Spray or dip. Carries State Fire Marshal's approval.



TO ORDER: Send check or money order. Enclose a minimum of ⅓ deposit for C.O.D. Calif. residents add 4% state tax. We extend a 10-day money-back guarantee on all merchandise. When applicable, state size, style, color, and 2nd choice if acceptable.

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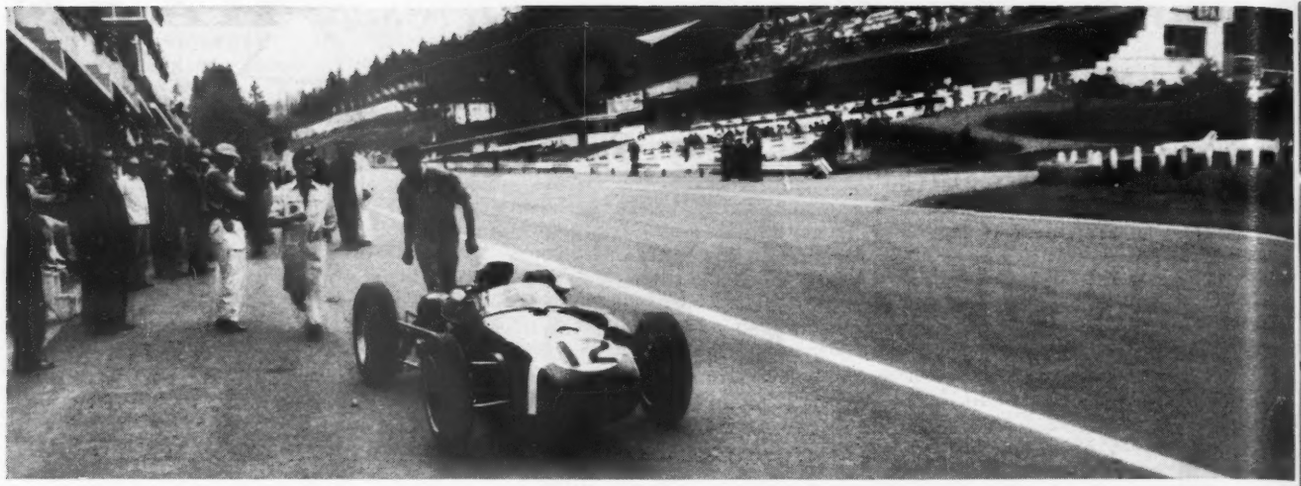
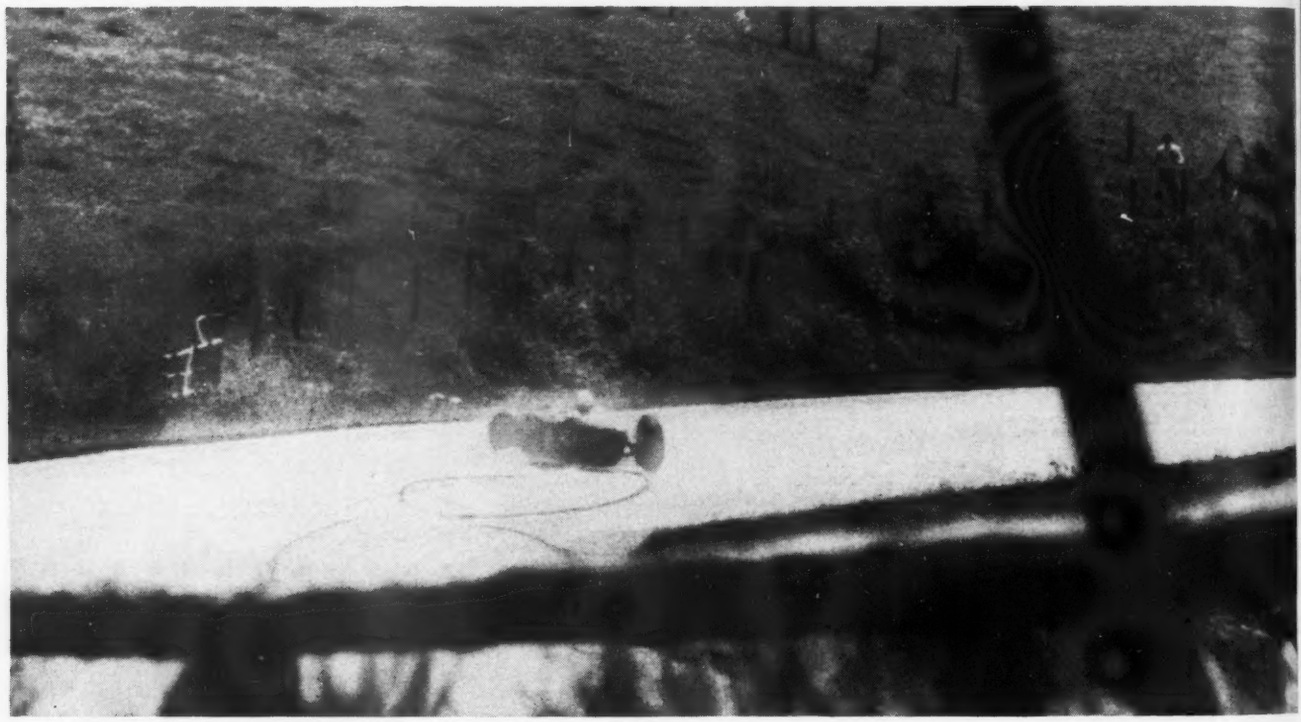


A confident Moss adjusts his goggles as he leaves the pits for a practice session in the Rob Walker . . .



. . . Lotus. Seconds later Stirling is alone at Malmedy Corner fighting for control, and his life . . .

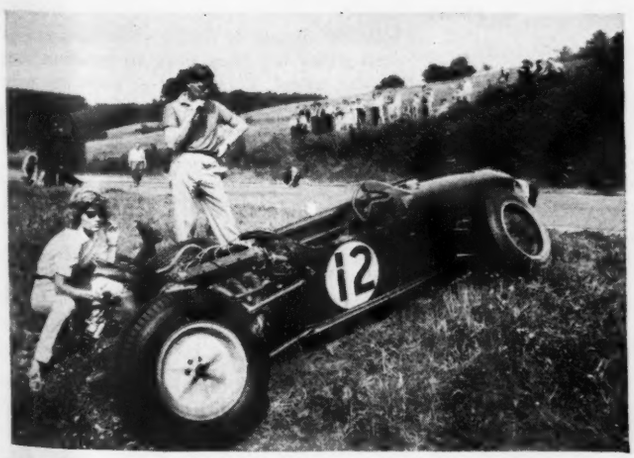
► Mishaps on a race course can be broken down into two types: those stemming from errors of judgment on the part of a driver or drivers, and those that are literally accidents. What befell Stirling Moss during practice at Spa can unhesitatingly be placed in the latter category. An exclusive series of pictures by SCI's European Editor Jesse Alexander shows the dramatic sequence of events that put paid to Stirling's hopes for a World Championship this season.

When entering Malmedy corner, which terminates a downhill straight, Stirling's left rear wheel came adrift. The Lotus three-wheeled across the track in a vicious slide, clouted the left-hand bank and then rocketed backward across the road. All this happened in less time than it takes to put these few sentences down on paper. The car came to rest upright, facing the track with the engine lid torn away and the nose drooping from its recent contact with the bank. The steering wheel was twisted into a shape resembling avant-garde sculpture, while the right side of the windshield was simply gone. As it sat in the grass it looked like a toy discarded by a spoiled child.

What of the damages to the driver? Medically speaking Stirling received a broken nose, broken ribs, and injuries to both knees. The real extent of the harm can only be assessed when he is well enough to go out and cut his first post-crash fast lap. *–SCI*

MOSS MISHAP

. . . as the car heads for the bank after losing a wheel. The little Lotus is concealed in a cloud of . . .



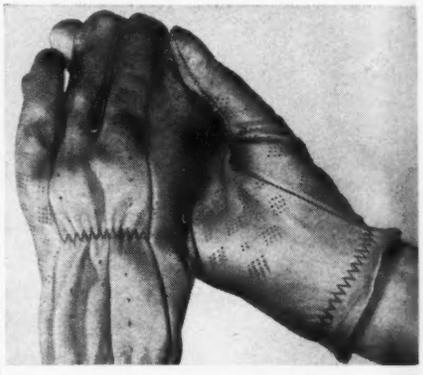
. . . dust as it ricochets across the road ending . . .

. . . in the grass, while the driver ends in bed.

PIPELINE

RARA AVIS A DEAD DUCK

Our "Rara Avis" (Pipeline, August, 1960) has been shot out of the sky. We asked readers to try to identify a four-door prototype with body by Touring. Several readers scored near misses when they said it was an Aston Martin. One wild shot raised the intriguing possibility that it was a Pegaso (the reader even bet his subscription that it was and said the Spanish firm "has been working on a 'compact' car for a year now.") But Pipeline's Nimrod Award goes to Ed Gaylord of Winnetka, Illinois. He wrote, "Couldn't resist identifying the prototype Lagonda. It was just completed when I visited Touring in Milan in early April. Its design closely resembles that of my Aston Martin DB4GT, also a Touring design." Readers seemed to enjoy the guessing game; we'll print some more pictures from time to time. In the meantime, if any of you have information or pictures of a four-door Ferrari, we'd like to hear from you.



DRIVING GLOVES

Supplement your masterful touch on the steering wheel with tremendously rugged yet butter-soft deerskin driving gloves. Among the best we've seen is this lightweight ventilated type available from D. R. Currie, taxidermist, Dept. S, Norwell, Mass. Fully-cut to avoid cramping fingers, even when wet they have tremendous drag on the wheel. Elasticized around the wrist and across the back, fine fit is insured. They're available in men's sizes 7 through 11½.

FREE SLIDE RULE

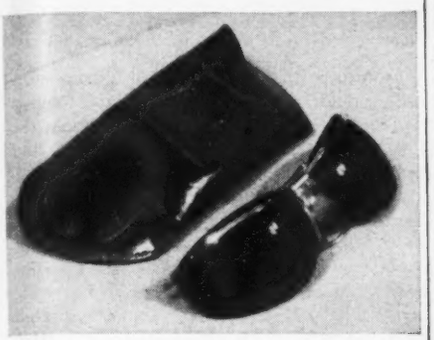
The General Industrial Co. is offering a free pocket-sized circular slide rule to engineers and business executives. Make your request on your business letterhead to General Industrial Co., Dept. S, 1,788J Montrose Ave., Chicago 13, Ill.

SQUEEZE PLAY

Tight space allotments have forced us to leave out a story entitled Two New Tracks which dealt with the inaugural event at the Louisiana Hilltop Raceway and the revival of the Vanderbilt Cup at Roosevelt Raceway. Sorry.

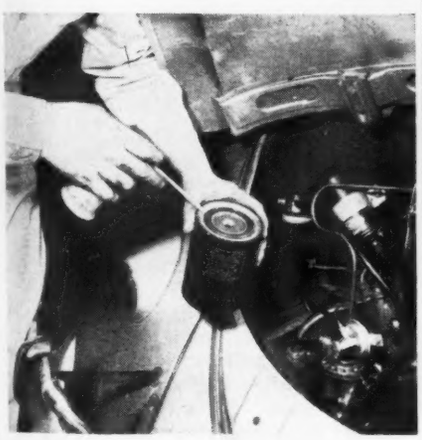
THIRD ANNUAL AUTORAMA

Over 300 automobiles of all kinds are scheduled to be on view at the third annual Springfield Autorama in the Industrial Arts Building of the West Springfield, Mass., Exposition Park Oct. 19 through 23. According to Joe Kizis, producer, it will be possible to examine the latest American and imported models in the exposition hall, then test drive them at the 750-acre exposition park.



CHIC SHADES

With comfortable deep-curved lenses, the Orma sports goggle is made in France. They have a green-tinted shatterproof lens and are optically correct. They fit any face, have no dig behind the ears and their light weight adds to comfort. Gold-filled frames are the finishing touch. Complete with a leather carrying case, they are priced at $17.50 and are available from E. B. Meyrowitz Inc., Opticians, Dept. S, 520 Fifth Ave., New York 36, N.Y. or from Formula 1 Ltd., Dept. SCI 10, 235 W. 46th St., New York 19, N.Y.



VW OIL FILTER

A new oil filter kit for Volkswagens has been introduced by the Fram Corp., Dept. S, Providence 16, Rhode Island. The unit, the K-11 kit, mounts to the left of the engine and features a PB50 "Easy Change" filter. Full instructions come with the kit and installation looks simple. It increases oil capacity by about a quart. Similar kits are available for the Simca Aronde, kit K-9, and the Opel Olympia, Rekord and Caravan, kit K-8.

4CV PRICES CUT

Port-of-entry prices on the Renault 4CV four-door sedan have been cut by $53 to $1,292 (East Coast). Price changes are not planned for the Dauphine or Caravelle.

(Continued on page 22)

MAGNIFICENT FULL COLOR 20"x 29" POSTERS

Three beautiful posters representing Mercedes-Benz victories in the late thirties. These colorful dramatic posters are practically historical documents, since they deal with the greatest period of motor racing history, Formula One events from 1937-1939. These posters are vividly colored classics of graphic art, startling and brilliant. Three famous races are recorded here, the famous Grand Prix of Belgium, with the magnificent M-163 featured in an exciting sketch, the Grand Prix of Tripoli in 1939, showing the incredible M-165, and the fabulous Grand Prix of Monaco, in 1937. Featured here is the never to be forgotten M-125 with its 600 horsepower engine.

P-1 **$10.00 THE SET**

Two brilliant colored posters of famous races. An explosively bright and simple poster of the "Monte Carlo of the West", the Grand Prix of Cuba of 1957, and a typically British poster for the British Grand Prix of 1958, in which all the information required by any prospective spectator is neatly arranged in varying colors.

P-2 **$5.95 THE SET**

Two fine posters from England; the first announcing an exciting day's racing at Brands Hatch. In startling black, green and yellow. The second announcing the famous Whit-Monday meeting at the BARC's Goodwood Circuit, well known as the hotbed of budding British drivers.

P-3 **$5.95 THE SET**

SUPERB STEREO TAPES PRODUCED EXCLUSIVELY FOR FORMULA I FROM RIVERSIDE RECORDS MASTER TAPES

Available for the first time, SOUNDS OF SEBRING 1959 is Riverside's famous annual report of this classic race, featuring hourly reports of this now historical rain soaked event of 1959, as well as interviews with all the famous drivers—Bonnier, von Trips, Hill, Cunningham, Gurney, Allison and others.

A4T1 **$12.50**

SPORTS CARS AT SEBRING IN STEREO is a tape of pure sound which features all the famous cars which were at Sebring in 1959, including Ferraris, Aston Martins, RSK Porsches, Elvas, O.S.C.A.'s, Arnolt Bristols, Maseratis and many others.

A4T2 **$12.50**

Please ship me the following items postpaid. I enclose $_____. I understand no C.O.D.

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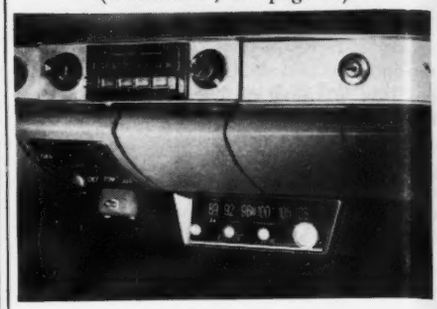
(Continued from page 21)

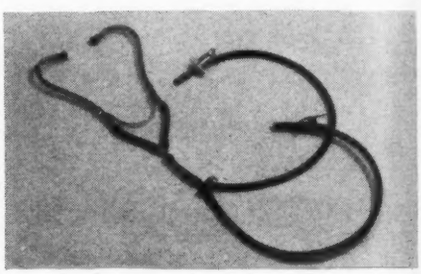


FM IN YOUR CAR

Motorola, Inc. has produced a transistor-powered FM radio adaptable to most sports and other imported cars. Known as the FM-900, it has an integral speaker and can operate independently or in addition to a car's AM set. Provided you could get the required distance between the sets, it should be possible to hear stereophonic sound when stations broadcast it. The FM-900 is one of 14 1960 models from the firm. The FM unit has a suggested retail price of $125. The AM universal model, 10 M, sells for $54.95.

CAR CARE AID

A light-weight car washer that attaches to a garden hose should take some of the drudgery out of keeping your car clean. Speedy-Clean features a replaceable foam plastic sponge mounted on a polyethylene top which holds a quantity of detergent. Its 32-square-inch cleaning area shortens work time as water is emitted over the entire surface. Water pressure is adjustable by twisting a no-leak valve. It's available from the S.P.S. Corporation, Dept. S, 2621 S.W. 9th Street, Des Moines 15, Iowa, and costs $3.49.



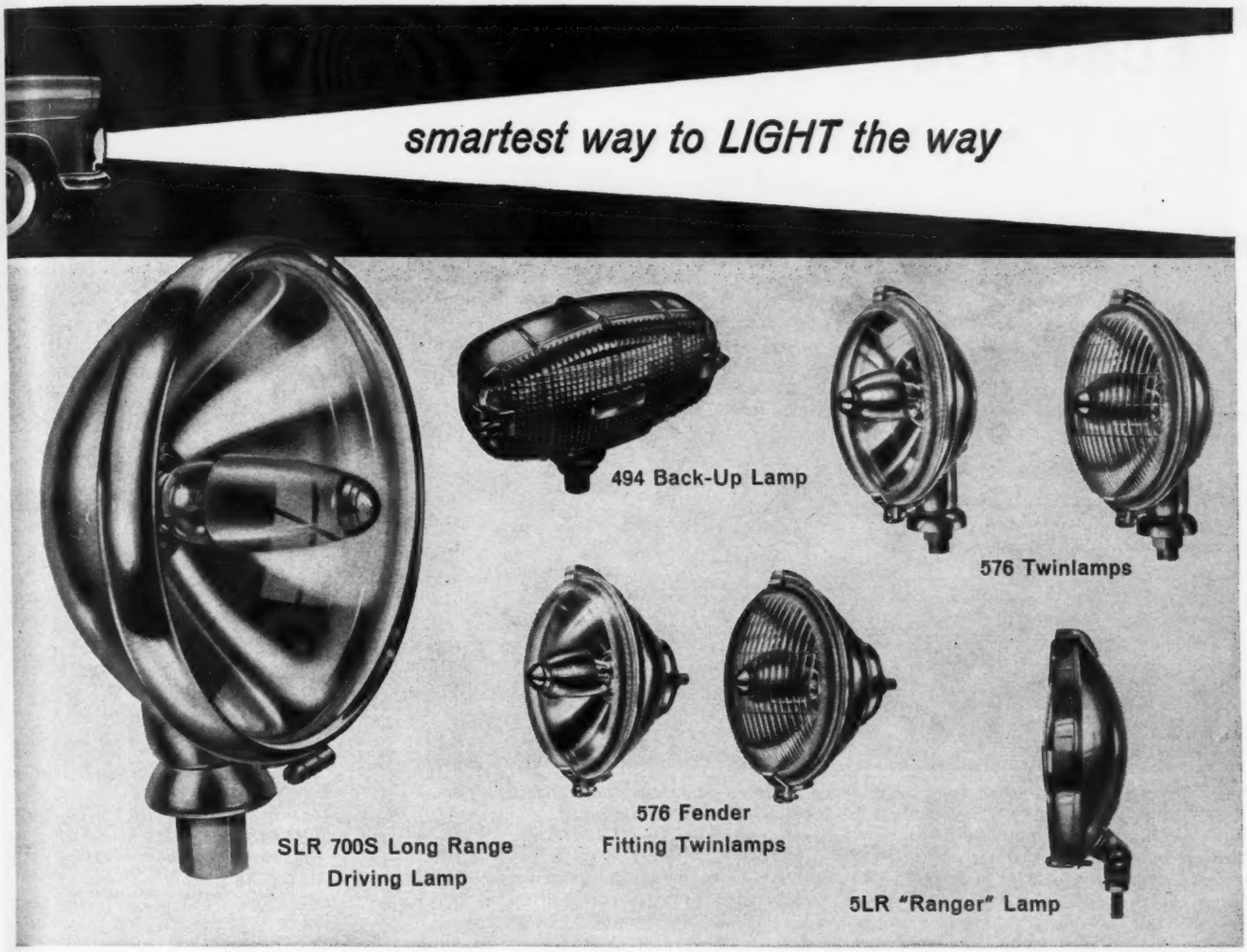
HOW HI THE FI

Hi-fi carburetor tuning should be a cinch with the Carb Sync stethoscope offered by Carib Engineering, Dept. S, Box 27, Benton Harbor, Michigan.

Similar to a physician's stethoscope, it features two tubes for multi-carburetor engines, to enable equalized setting of the units. The Carb Sync is an improvement over the time-tested method of synchronization, listening to the hiss at each jug. It features a two-way valve so the sound levels of the carburetors can be instantly compared.

The manufacturer claims it's useable on any type carburetor and leaves both hands free for making adjustments.

For Alfa Veloces, Porsche Carreras and similar cars equipped with cold air boxes, the air intake need not be removed. On engines with a separate intake port for each cylinder, mixture differences between the cylinders will be readily indicated. The complete unit retails from the manufacturer at $7.95.



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original equipment quality! Whatever make car, whatever your styling preference, you'll find a smartly designed Lucas accessory lamp to suit your individual lighting needs. In rallies or *any* night driving, regardless of weather, you'll *see more* while you add distinction to your car. But lamps are only a part of the complete range of genuine Lucas "made in Britain" accessories. Ask your dealer to show you the entire line.

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EUROPEAN NEWSLETTER

AMERICANS ON THE CONTINENT

An injustice was done to driver Ed Crawford when it was inferred that by his missing a shift in the new Jaguar at Le Mans on April 9th, a con rod let go. This was the official story at the time but now it seems that Jaguar was experimenting with titanium connecting rods in that particular engine. The driver would likewise not be shifting gears halfway down the Mulsanne straight where the incident occurred. The failure of an experimental con rod is no disgrace and we regret that Jaguar felt it had to put the blame on the driver for it only caused misunderstanding all 'round. The unofficial word is that Coventry has gone back to steel connecting rods, as well as further tests, in view of this failure.

Richie Ginther and his wife have taken up semi-permanent residence across the street from the Ferrari factory in Maranello. Thus situated he is always on call to test new cars and has been having a wonderful time – just driving Ferraris – and has become semi-official factory test driver. Richie has great hopes for the new rear-engined car (Formula 1), which he drove steadily if not extremely fast at Monaco on its first appearance; at Zandvoort however he piloted a conventional front-engined Ferrari as engine trouble plagued the new car.

Most impressive has been Richie's debut in Grand Prix racing. We now have four top-grade American drivers participating in European racing, Phil Hill, Dan Gurney, Chuck Daigh and Richie. Richie has of course taken to single-seaters like the proverbial duck to water and is turning times close if not equal on some occasions to those of the rest of the team. With Cliff Allison sidelined for the rest of the season, Richie is even more in the limelight, and Ferrari is depending on him to shoulder perhaps more of a load than would normally be expected of a driver in his first full European season.

FERRARI SEDAN?

That dynamic Latin duo – Enzo Ferrari and Pinin Farina – is at it again. The latest offspring of their collective talents is the recently-unveiled 250/GT "2 plus 2" coupe, perhaps the closest thing to a series "sedan" to come from the Modena factory.

Based on the standard 102-inch wheelbase, the "2 plus 2" offers front and rear seat head room of 35½ and 33½ inches respectively. The overall length is 185½ inches. Powered by a V12 engine, displacing 2.9 liters, the car has a top speed in the 125 to 143 mph range, depending on the rear axle ratio selected. The engine develops a maximum of 240 bhp at 7000 rpm and is coupled to a four or five-speed transmission. Disc brakes are used on all wheels. The "2 plus 2" will supplement the current Ferrari line which includes the 250/GT Coupe two-seater, the 250/GT cabriolet two-seater, the 250/GT California spider and the 250/GT Berlinetta.

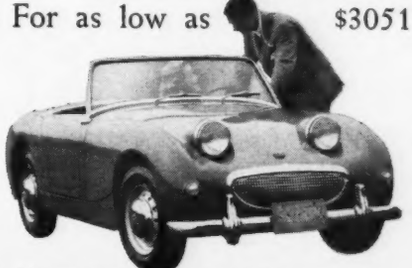
Space for four is featured in this tourer which combines Ferrari performance and Farina styling art.

REAR-ENGINED MASER?

After the armed forces, the automotive industry, by virtue of its diversity and secrecy bred of sales competition, is perhaps the most fertile field in which rumors flourish. These run from reports of the revival of Bugatti as a sales contender to the impending re-entry of Mercedes in competition. While most have no basis in fact, they are sometimes interesting conjectures offering pleasant diversion to bench racers. The latest in this category – a barefaced unconfirmed rumor – is that Maserati has a 2000 GT in the works. The alleged technical details are interesting. The twin-overhead-cam engine is mounted transversely at the rear, behind the rear axle. It features a crankcase/gearbox unit something along the lines of the Austin 850 and the three-carbed engine is tilted aft. The radiator for the powerplant is mounted at the front behind a conventional-looking Maser grille, complete with trident. It's said there are two power options for the 2/4 seater. There is a 2.5-liter engine developing 200 bhp at 5700 rpm and a 2-liter mill said to have an output of 160 bhp at 5600 rpm. Reportedly, Maserati will incorporate four-wheel independent suspension. Externally, the only clues that the 2000 GT is rear-engined are said to be a vent in the fenders just aft of the front wheels and Karmann-Ghia type rear deck slots. The muffler silencing the exhaust from the six-cylinder engine would also be mounted transversely and resemble that of a VW or Porsche. Immediately astern of the muffler is the spare tire, while the trunk at front contains the radiator and gas tank. *–SCI*

The Austin Healey '3000'

ODDS-ON FAVORITE. The sky's clear, the air's like wine. You're ready for fun, and ready to go. And so is this spirited performer. The Austin Healey '3000' is the fabulous successor to the famous Austin Healey 100-Six which has dominated competition in its class. The '3000' hugs corners, clings to the road with sure-footed assurance. Has speed in reserve for a straight-away 115 m.p.h. Disc br[illegible]ing it to a smooth, straight-line stop. Take this beauty out on the road, and you're really living. For as low as $3051 p.o.e. (2 or 4 seater).



The AUSTIN HEALEY SPRITE. The lowest priced *true* sports car on the market. Cleaned up in its class at Sebring. Top speed, 85 m.p.h. For as low as $1795 p.o.e.

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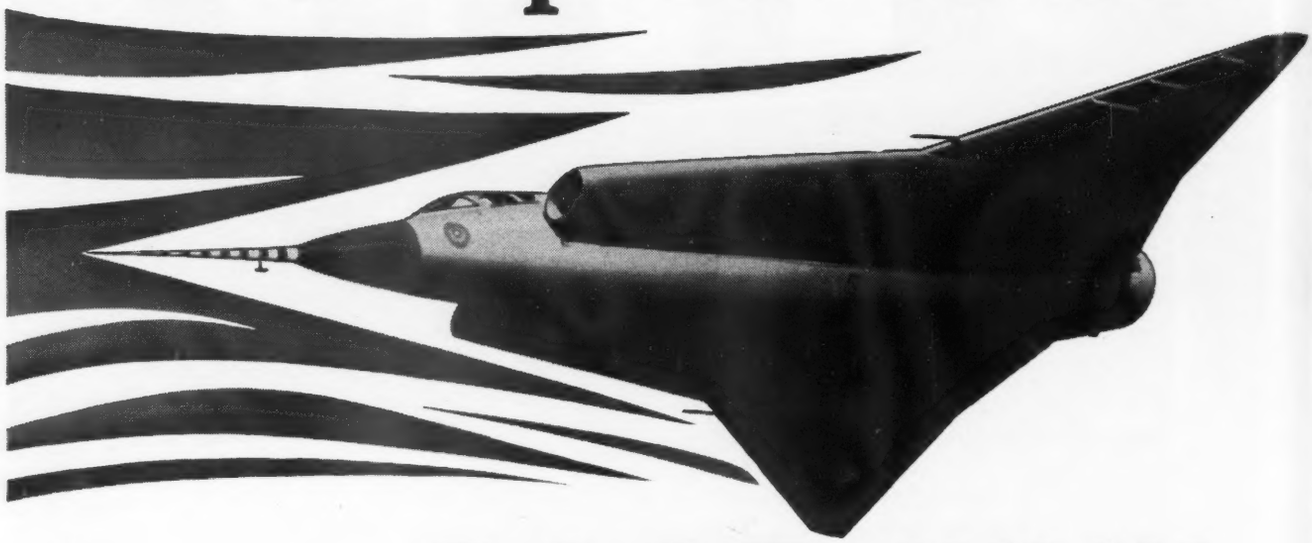
Sister Ships from Sweden!



1-passenger SAAB $800,000

SAAB-35 Draken . . . Double-delta wing supersonic jet interceptor! Its fantastic performance was the sensation of the recent Paris Air Show. Every SAAB automobile reflects the imaginative engineering and high-precision standards which have made SAAB one of the largest aircraft producers in Western Europe.

4-passenger SAAB $1,895*

SAAB-93 Sports Sedan . . . Greatest small car on the road today! Ten years ahead in design, because its Front-Wheel-Drive and Dual-Stroke Engine were first introduced in 1949 and have been proved over hundreds of millions of miles. The vastly superior performance and handling ease must be experienced to be believed! And remember, the complete price of $1,895* includes $276 worth of special equipment that costs extra in other cars.

*Suggested price, East Coast P.O.E.

SAAB
SWEDEN

Test-drive the SAAB, and compare!

See your nearby SAAB dealer, or write Saab Motors Inc., 405 Park Ave., New York 22

SPORTS CARS ILLUSTRATED
OCTOBER 1960

SCI was behind the scenes at Pontiac while their Tempest was more rumor than fact. Here's the story behind Detroit's most modern car.

INSIDE PONTIAC'S TERRIFIC TEMPEST!

by Bill Carroll

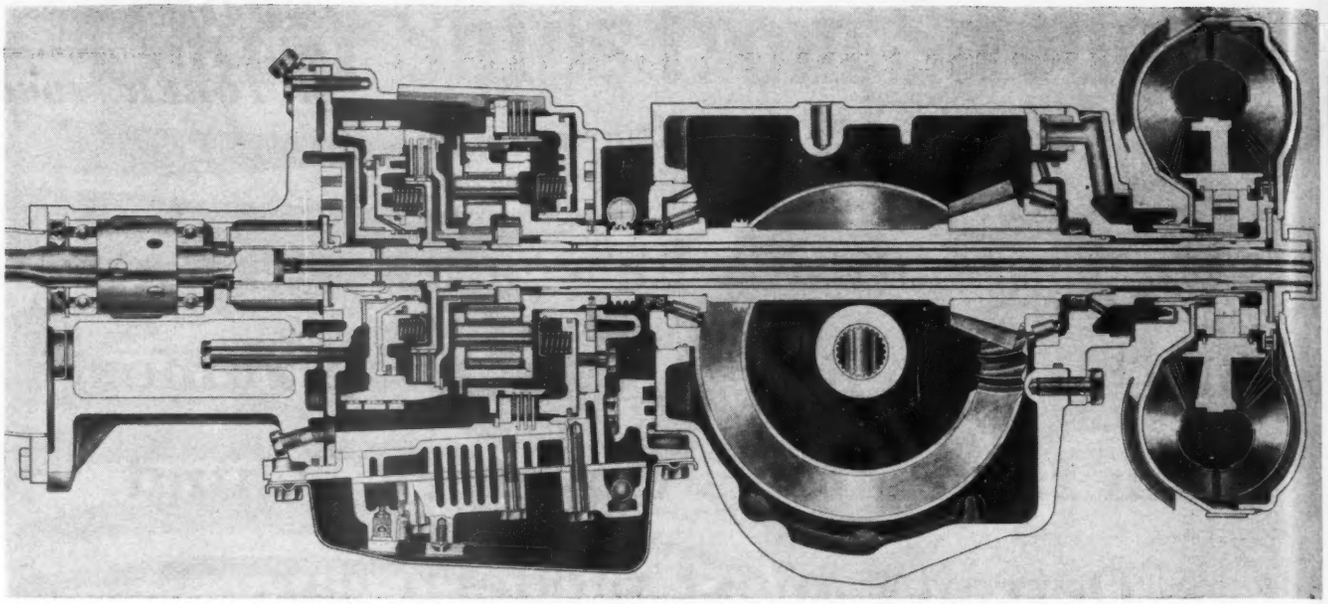
"We equal or surpass any compact built today in economy, performance, comfort, handling and roominess," says the Tempest project engineer for Pontiac. "And here's why: among engineering features classified as firsts are front engine with automatic or manual transaxle, solid propeller shaft without universal joints, and our unique 'compression strut' front suspension."

THE OVERALL VIEW

Before details, let's look at a complete car. Tempest sedans or wagons crouch on 112 inches of wheelbase with 57 inches tread front and rear. Overall length is 189.3 inches, and even the wagons are less than 54½ inches high. Tempests will be available in all colors, with all big-car options except power brakes. Interiors include a needle-type 120-mph speedometer with deep shielding to eliminate windshield glitter.

Tempest four-door wagons are sprung to carry the driver and 1050 pounds of cargo. Comparison between Tempest and a full-size 1961 Pontiac wagon finds the Tempest about 20 inches shorter outside, but only 11 inches shorter and 4.4 inches narrower inside. The 88-inch loading area has enough length for tall campers to sleep comfortably with the tail gate closed.

Basic Tempest power plant will be the long-rumored "leaning four" known in Pon-



Section of world's first true automatic transaxle shows torque converter at rear of car, right. In case at left are planetary gearing, control clutches.

tiac as "L-4". With 194.5 inches (4.06 x 3.75) it delivers 130 bhp with an 8.6 to one c.r. and single-throat carb, or 155 with a 4-throat at 10.25 to one. Power is applied through 6.00 x 15 tires, a highly practical size.

Inside the L4 you'll find the crank and cam modified to suit requirements of a four. However, the V8's three-inch main bearings remain to support only half the power impulses. Hydraulic lifters, dual valve springs and aluminized valves make up the valve train. Cylinder head and valve gear are right from the V8. Exhaust pipe and manifold are on the engine's right, with a lengthy crossover providing carburetor heat. From manifold to muffler, there's a 1.75-inch pipe feeding the reverse-flow 25-inch muffler with asbestos between the shells to help eliminate rumble. Intake manifold, carburetor, fuel pump, and 12-volt generator and starter are on the open left side.

L4 temperature is conventionally controlled by a coolant thermostat and gear-pump oil circulation. An oil jet sprays between fuel-pump cam and pump lever to prevent galling during high-speed operation. The baffled pan holds four quarts of oil, and a full-flow oil filter is available.

The optional aluminum V8 is of 215-cubic-inch capacity and has an 8.8 to one compression ratio. It uses regular fuel through a dual-throat carburetor, and is reportedly in the 150-165 horsepower bracket. A late-comer on the V8 scene, Pontiac will have to use the straight Buick version and won't be able to fit them in large quantities. (SCI will cover this exciting new engine in full next month—Ed.)

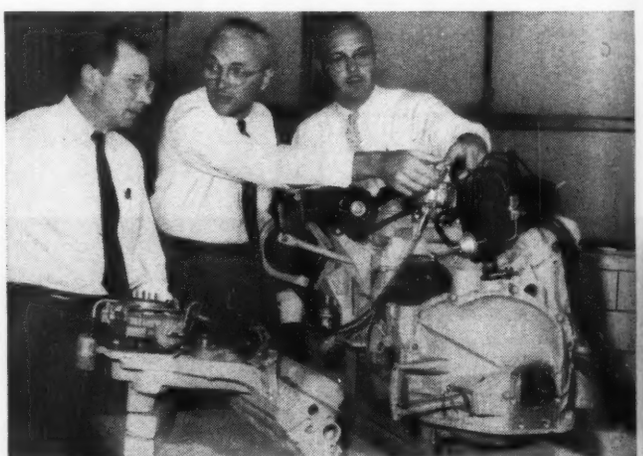
UNIQUE DRIVE LINE

Power transfer from engine to transaxle is accomplished by the most unusual drive shaft we've seen. The shaft is a ⅝-inch-diameter nickel-chrome-moly rod, shot-peened to reduce surface stress and coated to prevent corrosion. An engineer told us, "We wanted to keep details of our new drive shaft quiet. Sample parts were ordered in pairs and referred to as torsion bars, which soon gave rise to reports that Pontiac had torsion bar suspension under its compact."

A front flange on the solid drive shaft bolts to the clutch driven plate of manual-transmission cars. Automatic transmission engines have no clutch up forward, so the shaft flange is bolted direct to the flywheel by six cap screws. Because a long, rotating rod tends to vibrate if kept straight, Pontiac engineers curved the shaft inside a tube which joins engine and transaxle. The shaft, when bent into an arch, no longer obeys the laws of a beam and is not subject to the vibrations of a straight propeller shaft. Automotive engineers have always designed large drive shafts to cope with critical-speed vibrations, not because large tubes were needed to carry engine torque. Transmission parts, such as the spline shaft of a three-speed manual, are of smaller diameter than the ⅝-inch Tempest drive shaft.

Bending the shaft into an arc eliminated critical vibration points, leaving only second-node vibrations to be controlled by two damper bearing blocks fitted inside the torque tube.

Nearly all test miles on the solid drive shaft were run in full-size cars with a large V8 engine providing the twist.



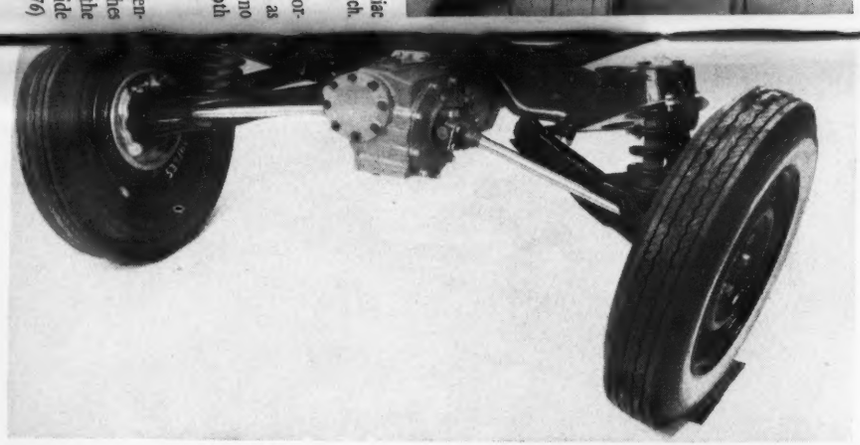
Mark Frank, Norman Cheal and Edmund Windeler, left to right, Pontiac engineers, check Tempest power plant. 4-throat carb head sits on bench.

An advantage of the solid drive shaft is that it acts as a torsion bar to absorb engine torque throb. The shaft also acts as a constant-velocity power transfer device, there being no universal joints to shift velocity and disrupt the smooth flow of power.

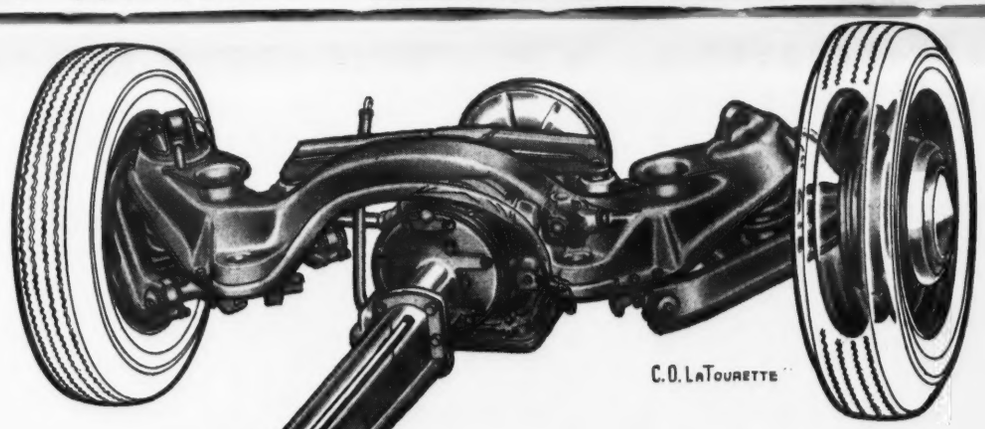
ASSEMBLY AND AXLE

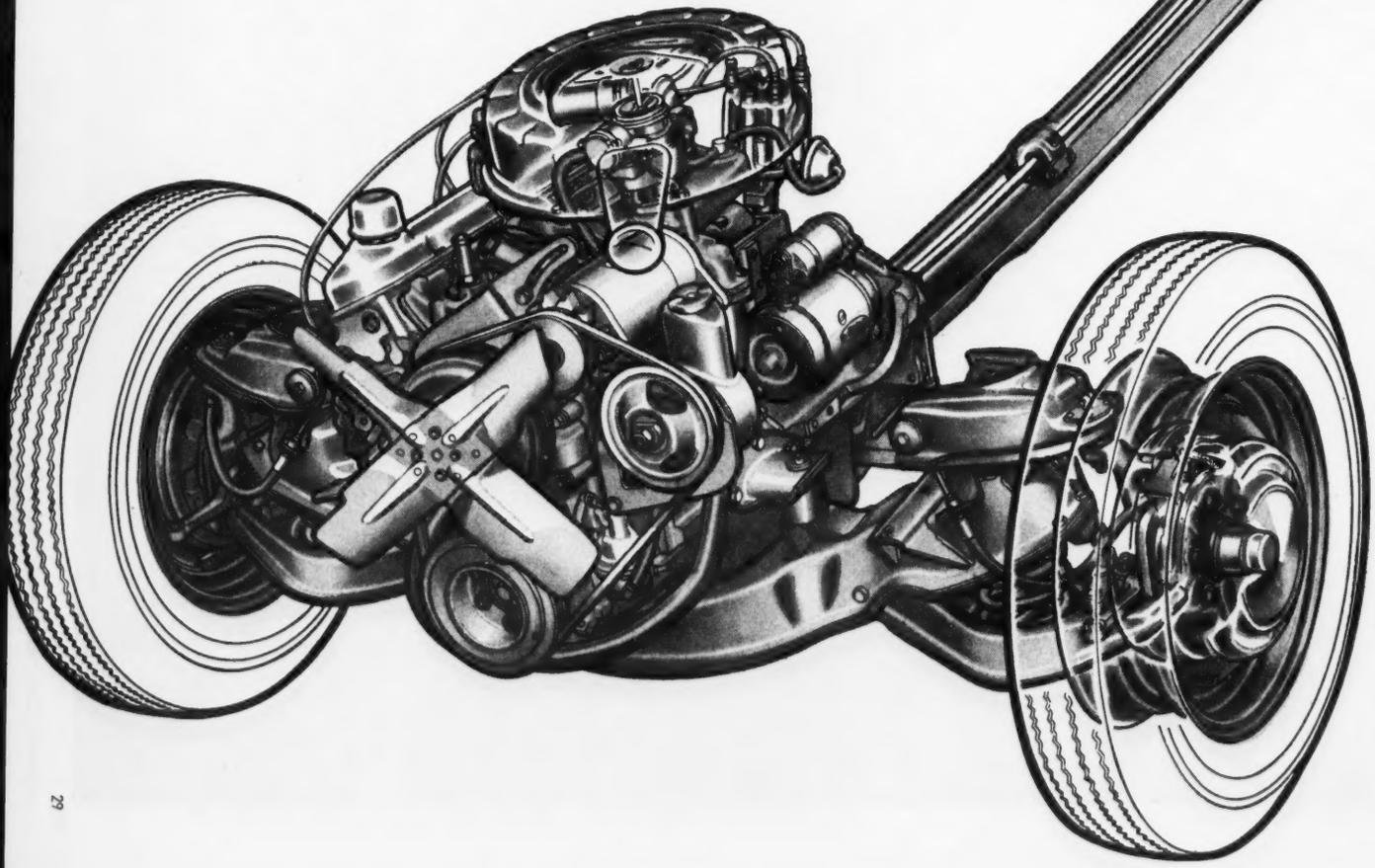
Success of Tempest's solid drive line depends on the central backbone tube. It is a channel section about six inches deep that has been formed with a slight sag which drops the center about eight inches below the ends. The open side

(Continued on page 76)

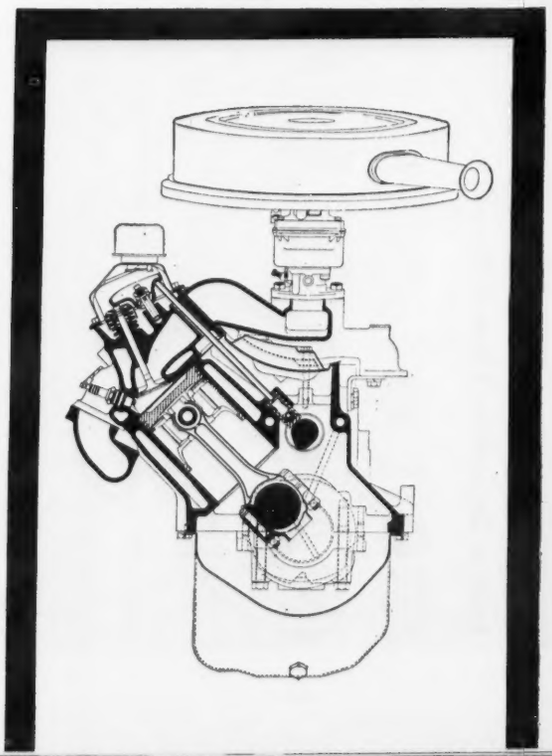


Pontiac Tempest's independent rear suspension features a transaxle, shown here in manual shift version. Stub axles have single universal joints at inboard ends. Wheels hang on trailing A-arms.





. . . our front-engine, rear-transmission design gives the Tempest the long-desired 50-50 weight distribution."



The last great racing cars of classic style are lovingly crafted by hand in the spotless shops of the . . .

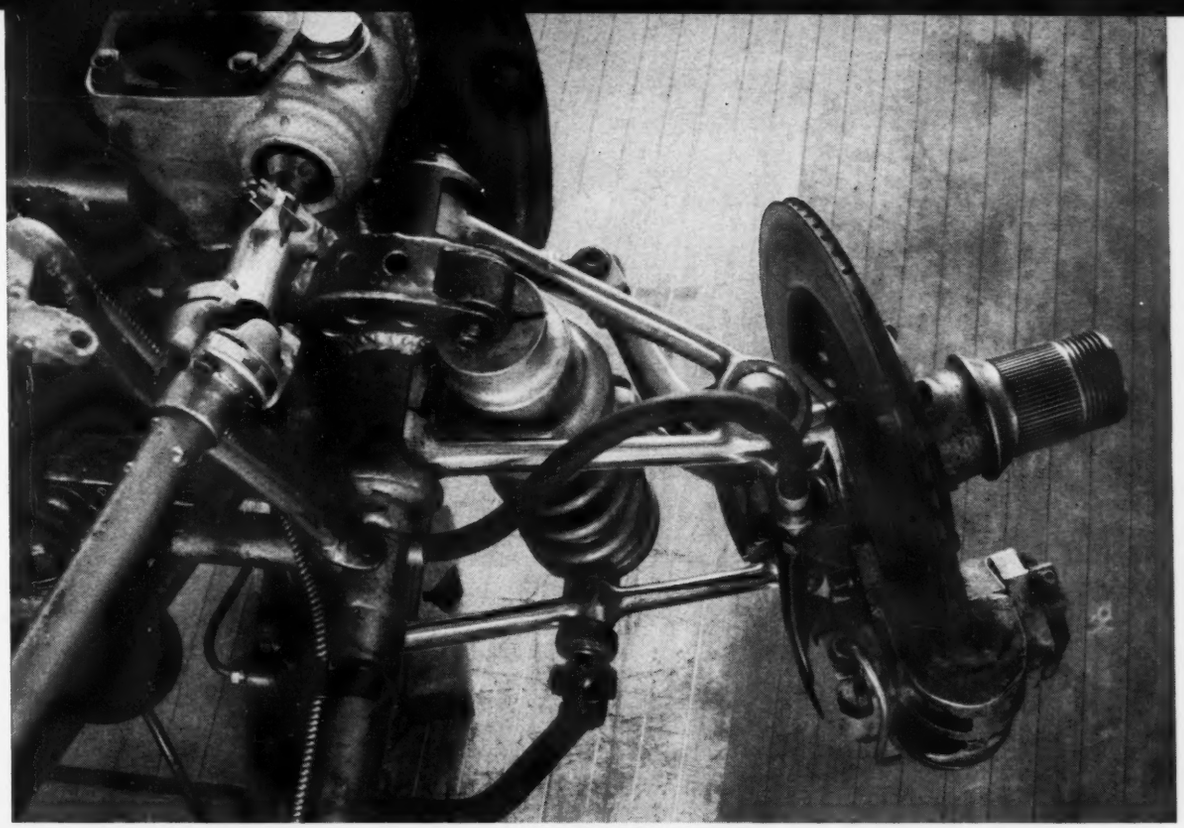
men of MARANELLO

PHOTOGRAPHY: WEITMANN

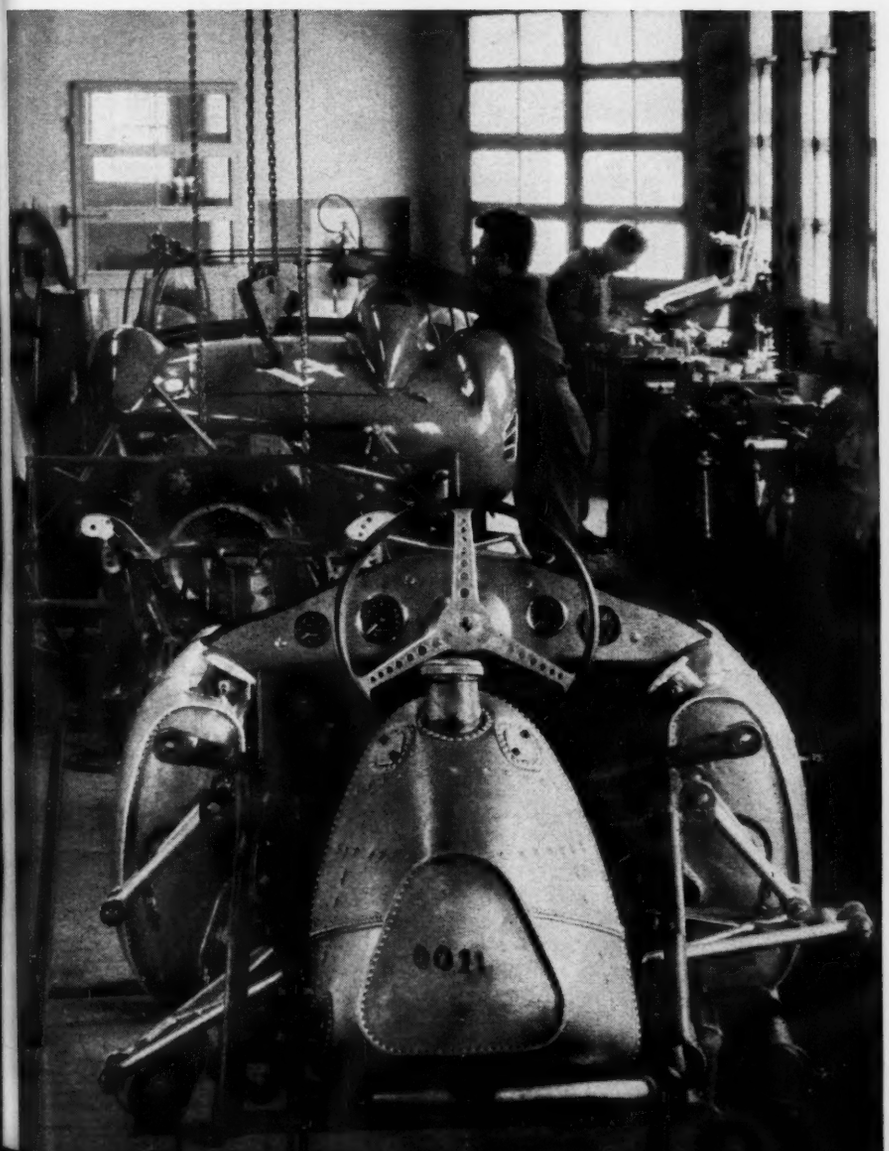
► These are the days of Lotus and Cooper domination in Grand Prix racing, of the triumph of rear-engined lightness. Unable to beat them, Ferrari has joined them, as we saw last month. But everyone who cares about the atmosphere of racing will be profoundly sorry if the rasping, fire-breathing, brutally-understeering front-engined G.P. Ferraris have to vanish from the scene. They are without a doubt the last of the great classic racing cars.

Ferrari's feudal factory in Maranello continues to make the finest sports cars in the world. No other make or builder could even have tried to duplicate Ferrari's utter sweep of the 1960 Le Mans, a race which can be dull, hard work but which still proves the solid worth of an automobile. Ferrari and his men are still the masters of their craft.

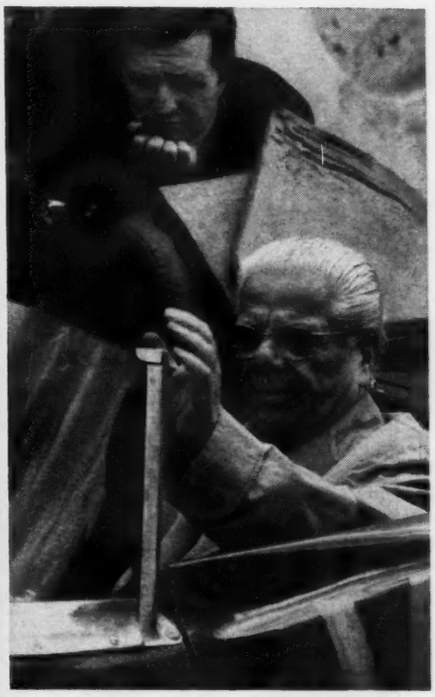
Seldom seen at races, Enzo Ferrari (in fedora) attends Monza trials of a 1960 G.P. car. Phil Hill's at the wheel; Chief Engineer Chiti at right.



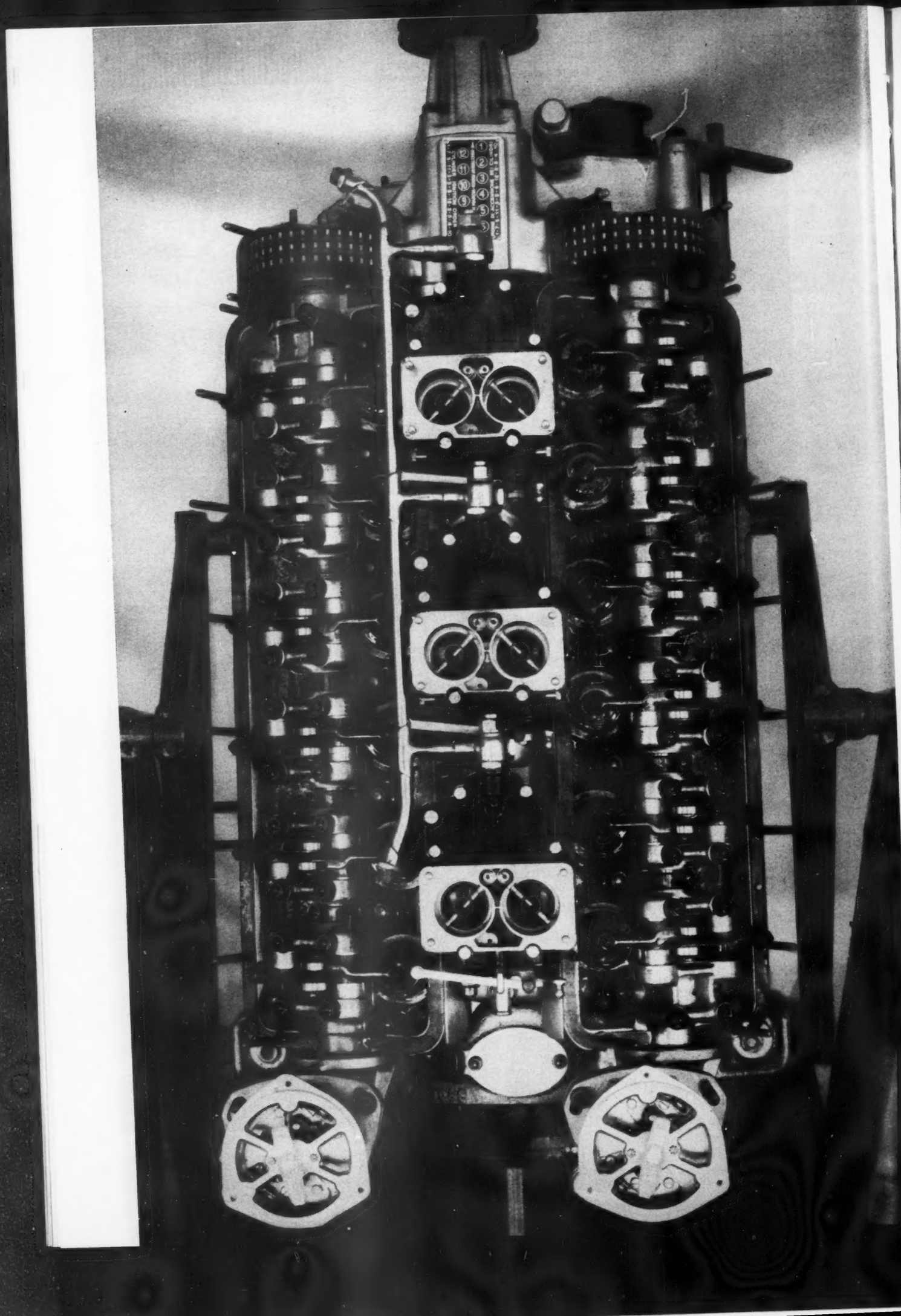
Strength and efficiency of racing Ferrari front suspension is exceeded only by its beautiful form. Disc brakes are from Dunlop of England.



1960 side-tank Grand Prix Ferrari sits stripped in sacrosanct experimental shop, at left. Work also progresses on sports car frame, F.I.A. top.



Ferrari racing bodies are built by Scaglietti but designed by Pinin Farina, who is personally concerned with details like windshield post.



Road Research Report: FERRARI 250/GT Berlinetta

► From the tips of its thrusting headlights to the end of its tucked-in tail, Ferrari's newest Berlinetta exudes the essence of speed and power. For once the externals don't mislead. This is a fast car, potent almost to the point of being brutal. Its physical size is deceptive, though. A dozen yards away it looks compact, almost small. As you move closer and actually climb aboard it gets bigger and bigger; when you fire it up and get under way it becomes quite a healthy-sized machine! If this Ferrari seems bigger-than-life at rest, it's definitely so when on the go.

AN EXCELLENT ENGINE

The car is a fine one, among the world's best. We'll deal with the specifics of this later. Right now we want to establish, without equivocation, that it's powered by *the greatest automotive engine in the world today.* There's no other engine that begins to compare with it, that deserves mention in the same breath with the Ferrari V12. Let's name some others: the Jaguar twin-cam six? It's been around as long as the Ferrari, and has been impressively versatile, but unlike the V12 it's no longer winning major races today. The four-cam Porsche? Very sound, very successful engine, but with a birthday in 1953 it's a relative new-comer on the scene. The Chevy V8? An American immortal, extremely able, but also young by Ferrari standards and varying tremendously in tune between road and racing applications.

There must be some others. How about Mercedes? Even with fuel injection the 300-series six isn't competitive in racing today, while the M196 straight-eight didn't live long enough. Maserati has built many fine engines but hasn't been able to stick with a single one for very long, at least not one that's still with us today. The Meyer-Drake Offenhauser is an immortal powerplant, but definitely *not* versatile. In the twin-cam FPF, Coventry Climax has an excellent engine, but it hasn't really been baptized on the road yet. Once effective on both highway and race track, Lancia's classic V6 is now merely a pedigreed passenger-car engine.

Think of these examples. Think of all the car engines in production today, and see if you can come up with another that has lived for 13 years, almost constantly in production in different size variants, and always able to win major races or the classes with which it coincides. Far from being at the end of its life today, the V12 has just been redesigned in detail with an eye toward real quantity production and use. And what uses! The same basic engine that just won Le Mans is propulsion for a silky-smooth, Lincoln-Continentalesque touring coupe. "Basic" is not a loophole here, either. There are differences between the road and racing V12s but they're remarkably few. For the background story on Ing. Colombo's masterwork, see the September, 1959 SCI. To fill in the foreground in sharp detail, SCI drove one of the latest 250/GT Berlinettas (Charlie Kreisler's car, the fourth-place finisher at Sebring) over 1200 miles, on both road and race track – an unforgettable experience.

REDESIGN TO STANDARDIZE

During 1959, as part of a standardization program to smooth out the production process at Maranello, the type 250 V12 was given the first significant redesign in its history. The biggest single change – or decision, actually – was the use of the former Testa Rossa cylinder head on all the 250/GT engines across the board. This head design first appeared at Le Mans in 1957, on the car that served as the prototype for the production 250/TR of '58. It eschewed siamesed intake ports (three per bank) in favor of six separate ports per head, but to do this the spark plugs had to be moved around to the outboard, exhaust side of the engine. Our ⅛-scale cross-section in the data panel shows the older design; a photo shows the latest heads.

Why didn't they settle on the older head? Obviously the new one allows much better breathing when properly carbureted. Less obviously, moving the plugs and ignition wiring out of the central vee lessens the danger of an errant spark igniting spilled gas from the carbs that also occupy that space. Crackle-painted shields above the exhaust manifolds deflect heat away from the wiring and from fingers feverishly extracting spark

plugs, a consideration in long-distance racing.

A major departure from the gospel according to Colombo is the use of coil valve springs in place of the "mousetrap" or hairpin-type springs that have been inseparable from the Ferrari philosophy for years. They were fitted for one reason only: service ease. The old hairpin springs took up so much fore-and-aft space in the valve chest that certain cylinder head hold-down studs couldn't be tightened while the valve gear was in place. For this reason, less fastidious mechanics would "forget" to torque the heads down a second time a few running hours after a rebuild — a highly necessary operation in an all-aluminum, wet-liner engine like this one. That frantic photograph on page 32, which also displays the roller-rocker valve gear, shows how accessible the studs are now.

FAN BELTS AND BOTTOM ENDS

Another change from "racing" trim is in the generator mounting. Hitherto it's been cradled in the upper part of the big timing case casting, driven directly from the sprocket that pulls the chain down between the two camshaft sprockets. The fan, when fitted, was then spun by a tiny fan belt from a pulley on the front end of the generator. Now that central sprocket is made to turn a pulley directly (through a cast extension that bears a plate explaining the firing order in both Italian and English), over which a longer belt runs to the generator, placed out on the right with a conventional adjustment, and to the fan, just below the drive pulley.

One extremely neat feature is the magnetic clutch fitted to the fan. A little thermostat in the top water pipe keeps tabs on the engine temperature, only clutching the fan to its pulley when water temperature rises above 170° F. to 175°. And the fan itself is an ordinary stamped part instead of an elaborate light-alloy casting. Another front-end change was abandonment of the original Ferrari re-usable oil filter in favor of a modern disposable-case filter projecting forward on the right side of the timing case. Our R.R.R. car had an additional filter for a secondary oil supply hung on the right side of the engine room.

Also related to the oiling system is the cast oil pan, newly-reshaped to be narrower at the front than before. For such a high-performance unit, by the way, the Ferrari V12 is almost unique in having a wet-sump lubrication system, with a single oil pump gear-driven from the crank nose. Even in the early Fifties the big 4½-liter Ferrari Grand Prix V12s with almost 400 horsepower got along fine without extra scavenging pumps and oil reservoirs. While we're down in this part of the engine, recall that the original small bore of the Colombo V-12 made it necessary to split the connecting rod big ends along a 45-degree line so the bottom of the rod could be pulled out through the cylinder during an overhaul. Now that the engine's being built only as a three-liter, with a much bigger bore, the rod has been given a conventional big end, split at right angles to the shank (see page 35).

HOW THE V12 BEHAVES

That's what's been done to "standardize" this engine — this remarkable V12, the only powerplant for cars with that many cylinders being built in the world today. It's no secret, of course, that this very multiplicity of cylinders accounts for the 250/GT's astounding versatility, allowing a very "wild" state of tune to be applied without giving it an ill temper. What happens to the driver's composure when he twists the ignition key 180 degrees to the right (90 degrees suffice for accessories only) and presses it to start, is another matter entirely.

There is no choke or rich-mixture control; a couple of pokes at the accelerator pumps of the triple Webers will do nicely if the weather's crisp. If it's hot or if the engine is, switch on the auxiliary electric fuel pump (a light reminds you it's on) to flush vapor lock out of the system. That pump is left on if you're driving the car hard in hot weather. With these precautions and a skilled foot on the throttle the V12 quickly finds its voice. It idles well, not smoothly with a hum but regularly with a rumble, and the actual idle speed can vary. You can vary it yourself by remote control with a big knob on the left wall of the cockpit, or you can wait for it to change of its own accord between 700 to 1000 rpm, depending on the weather and running temperature. About the latter, believe it or not: from mid-Manhattan, New York, prowling around town in ordinary traffic waiting for interminable lights, to the high speeds of the turnpike or race track, neither oil or water temperatures ever rose as high as the 190-degree mark! We didn't cheat; we left it idling at lights and in situations where sports cars of far more "practical" makeup would quickly have come to a boil.

EXCITING SOUND AND FURY

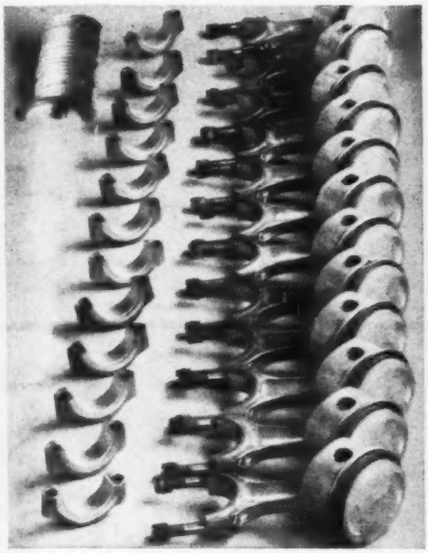
Throttle response is live and obedient to a toe's touch, above the Berlinetta's 1400-rpm green-line. If you stab it suddenly below that speed, either in or out of gear, there'll be a pause for throat-clearing before the action starts. When you take your foot *off* the pedal there's quick response too, a rapid drop in revolutions according to your needs. You'll get an idea why when you switch off, too: the engine halts with a sudden "whump" that betrays the absence of excess rotating mass.

When it's running this ultimate engine is exhilarating, electrifying. Twelve pistons, 24 valves and roller-tipped rockers, two cams, a few yards of chain and an assortment of pumps combine to produce the most wonderful racket ever to reverberate in an eager enthusiast's eardrums. This soul-stirring cacophony is controllable — the first-time driver learns with a thrill — up to and including a gut-quivering roar with only gentle pressure of the right toe. In the cockpit the din is muted to a many-leveled mechanical whine up front and an urgent crackle from the quadruple tailpipes. It's quieter, but still not the kind of engine that keeps you checking the oil pressure "idiot light" to see whether or not it's stalled! Innocent of insulation, the

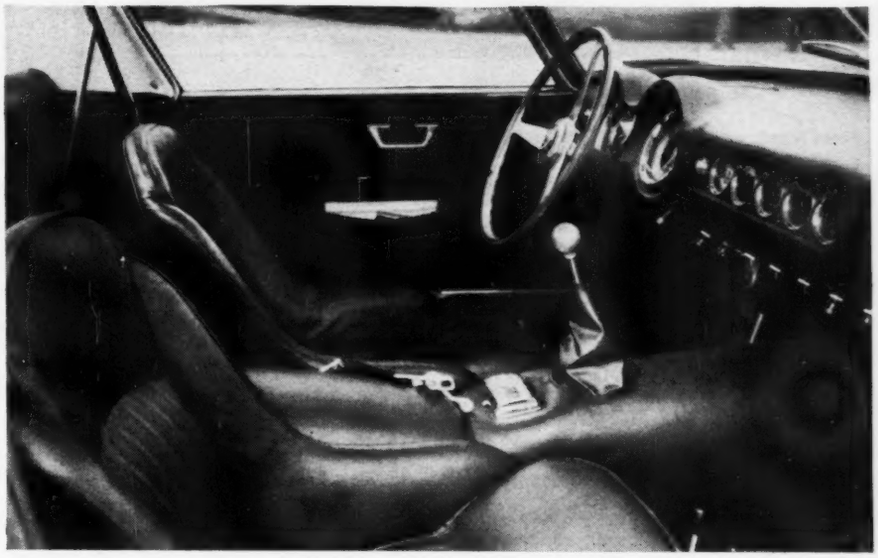
(Text continued on page 72; data overleaf)

Four jutting exhaust pipes, soup-plate-sized fuel filler cap and a plastic bug deflector leave little room for doubt as to the Ferrari 250/GT Berlinetta's exact purpose in life.

A driver's-eye view of the 250/GT. On the right is the 180-mph speedometer flanked by the revolution counter.

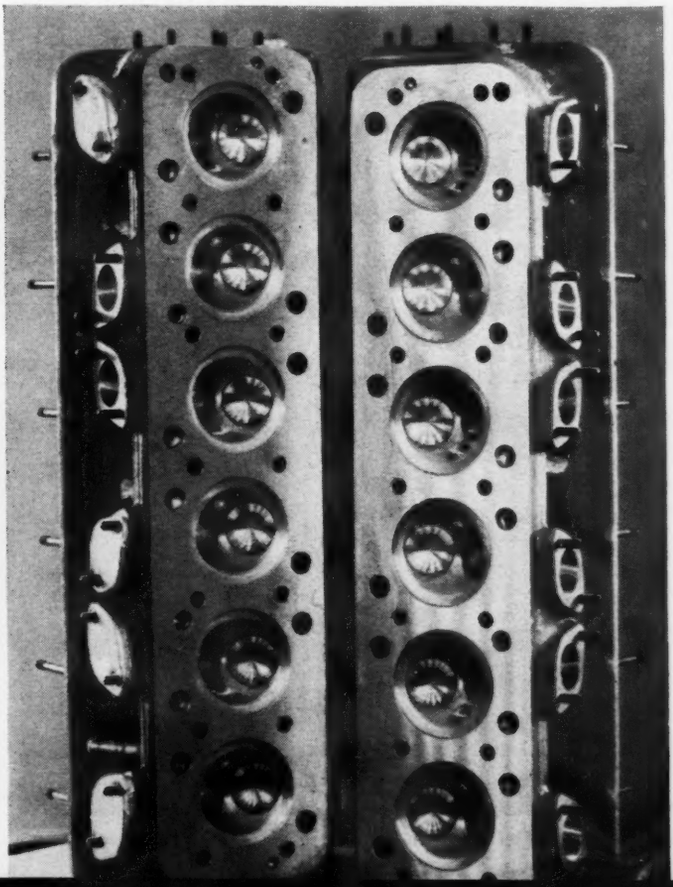


Twelve pistons and connecting rods help explain what costs all that money. These rods have the latest horizontally-split big ends.



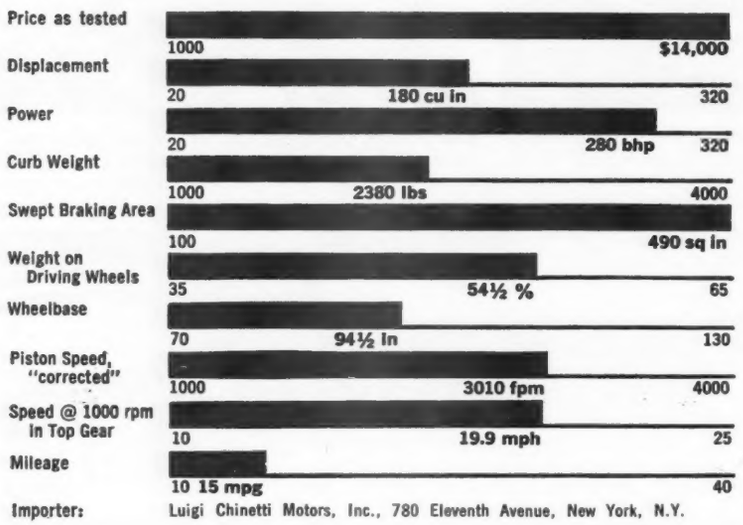
Comfortable seating for both driver and passenger plus well-finished interior mark the Berlinetta as a true dual-purpose car. It is one of the few machines that can win major races in "production" tune. Hand-filling knob on gear lever is close to wheel rim, which is arm's reach from seat back.

The SCI test car gets a little exercise at Cumberland during an SCCA national event. It traveled to and from circuit on its own wheels.

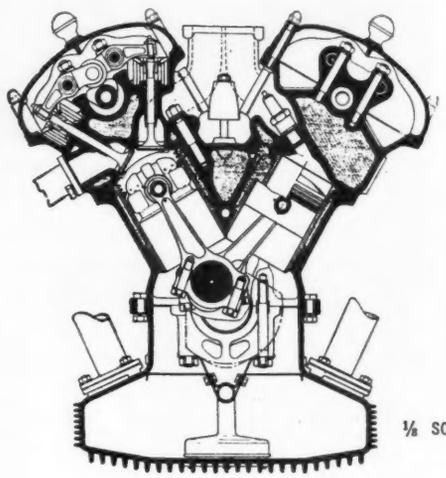


New cylinder head has plug hole on exhaust side, and separate intake ports. Inner circle in chamber indicates bore of early 2-liter engine.

Road Research Report:
FERRARI 250/GT Berlinetta



Importer: Luigi Chinetti Motors, Inc., 780 Eleventh Avenue, New York, N.Y.



⅛ SCALE

ENGINE:

Displacement	180 cu in, 2953 cc
Dimensions	Twelve cyl, 2.87 x 2.32 in
Compression Ratio	9.2 to one
Power	280 bhp @ 7000 rpm
Torque	203 lb-ft @ 5500 rpm
Usable rpm Range	1400-7000 rpm
Piston Speed ÷ $\sqrt{s/b}$ @ rated power	3010 ft/min
Fuel Recommended	Premium
Mileage	14-16 mpg
Range	440-500 miles

CHASSIS:

Wheelbase	94.5 in
Tread, F,R	53.3, 53.1 in
Length	163.5 in
Suspension: F, ind., wishbones, coils anti-roll bar; R, rigid axle, leaf, radius arms.	
Turns to Full Lock	1.3
Tire Size	175 x 400
Swept Braking Area	490 sq in
Curb Weight (full tank)	2380 lbs
Percentage on Driving Wheels	54.5%
Test Weight	2595 lbs

DRIVE TRAIN:

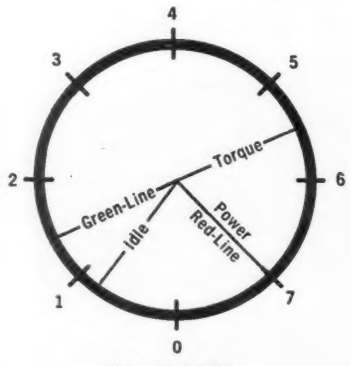
Gear	Synchro?	Ratio	Step	Overall	Mph per 1000 rpm
Rev	No	2.96		11.85	6.7
1st	Yes	2.54	49%	10.17	7.8
2nd	Yes	1.70	35%	6.80	11.7
3rd	Yes	1.26	26%	5.04	15.8
4th	Yes	1.00		4.00	19.9

Final Drive Ratio: 4.00 to one

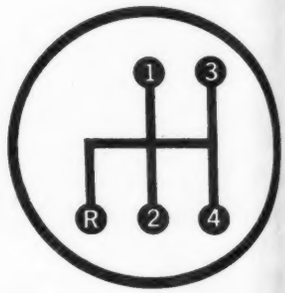
Also Available: 3.44, 3.55, 3.67, 3.78, 4.25 and 4.57 to one

36/42 psi, F/R
Steering Behavior

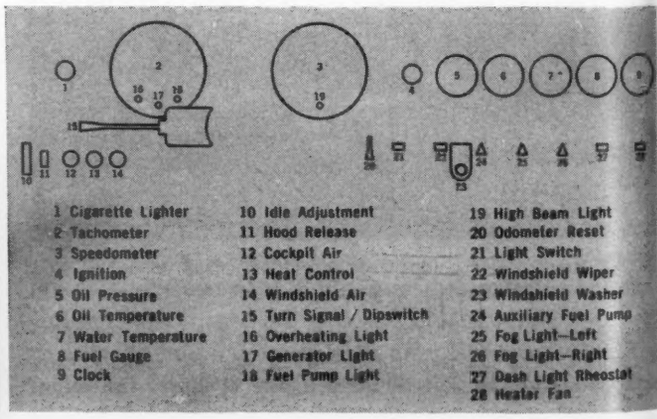
Turns to Full Lock



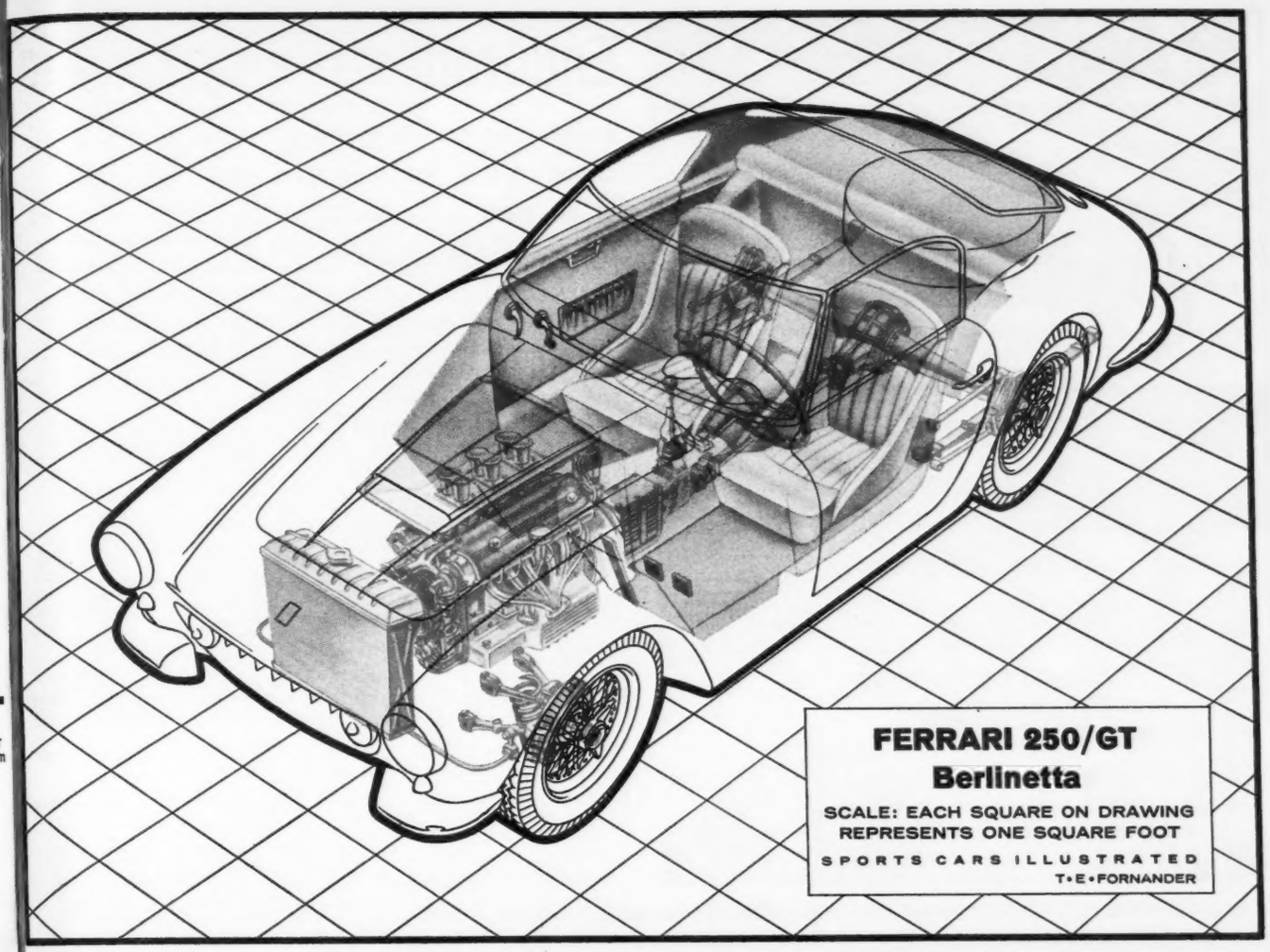
Engine Flexibility



Shift Pattern



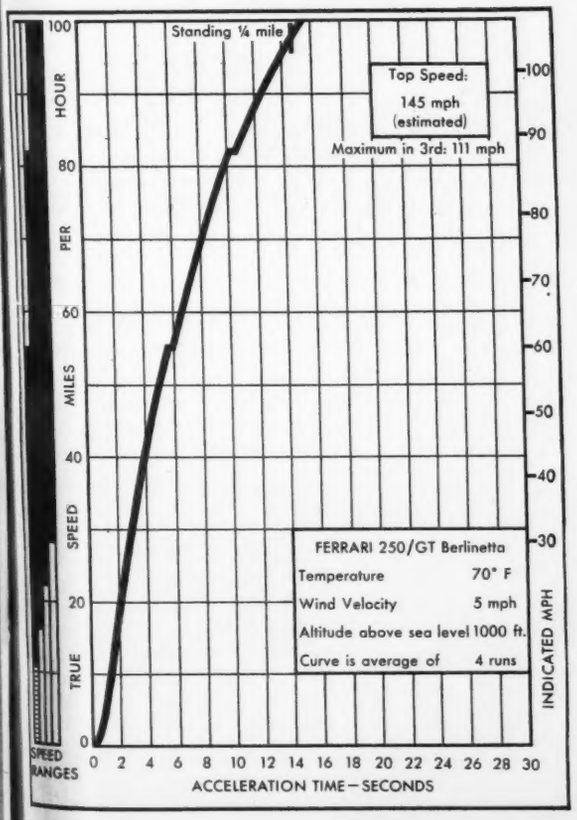
1 Cigarette Lighter
2 Tachometer
3 Speedometer
4 Ignition
5 Oil Pressure
6 Oil Temperature
7 Water Temperature
8 Fuel Gauge
9 Clock
10 Idle Adjustment
11 Hood Release
12 Cockpit Air
13 Heat Control
14 Windshield Air
15 Turn Signal / Dipswitch
16 Overheating Light
17 Generator Light
18 Fuel Pump Light
19 High Beam Light
20 Odometer Reset
21 Light Switch
22 Windshield Wiper
23 Windshield Washer
24 Auxiliary Fuel Pump
25 Fog Light—Left
26 Fog Light—Right
27 Dash Light Rheostat
28 Heater Fan

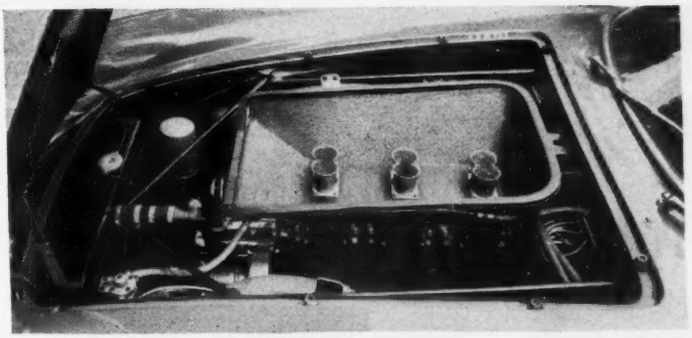


FERRARI 250/GT
Berlinetta

SCALE: EACH SQUARE ON DRAWING REPRESENTS ONE SQUARE FOOT

SPORTS CARS ILLUSTRATED
T•E•FORNANDER





Endurance is Emphasized

Twenty-four American drivers provided most of the drama at this year's Le Mans race. With this kind of an effort an all-U. S. victory can't be far off.

by Jesse Alexander

Spray spews behind the top-finishing Porsche, the Carrera GTL of Linge and Walter, as it scoots through rain-swept esses to an 11th overall.

Gregory sights over weird Maser windshield blasting to astounding lead.

"All of a sudden...poof," says Windridge. Duntov, back to camera, listens.

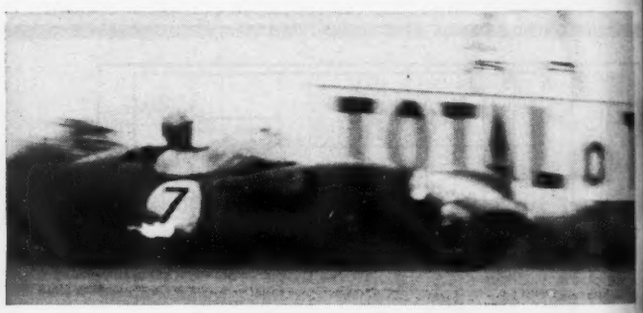
Ferrari's Tavoni caught napping.

► The 1960 Le Mans race drew the heaviest American contingent yet seen at the famous Sarthe circuit. The formidable Chevrolet Corvette group led by Briggs Cunningham plus the Camoradi-entered Corvette provided a much-needed degree of interest in the race. Americans were to be found driving everything from Sprites to Oscas to Jaguars to Ferraris, and after all was said and done a North American Racing Team Ferrari finished second overall, ably driven by Rodriguez and Pilette, a Mexican and a Belgian. Hopes for an outstanding Corvette showing faded early and the best the white and blue Detroit iron could do was 8th and 10th, overall. Highest-placed all-American entry was the Arents/Connell Ferrari 250/GT which turned in a creditable fifth overall.

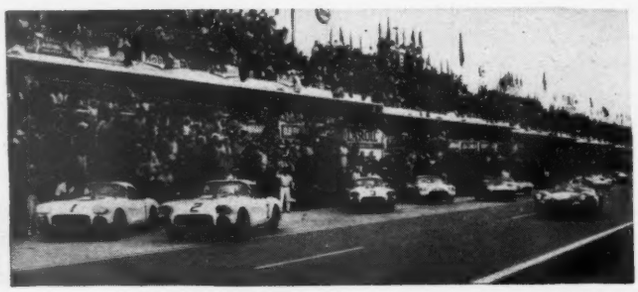
7 a. m. Sunday. Piano, piano!

More than a little pre-race interest centered around the Cunningham Jaguar to be driven by Hansgen and Gurney. The car arrived at Le Mans directly from the Coventry experimental shop and since its last appearance at Le Mans in April, a large fin had been added at the back. Regrettably the car was involved in an accident with Fritz D'Orey's Ferrari on the first night of practice and had to be driven back to the garage for hasty repairs to its beautiful nose. It arrived late at the second session with Dan Gurney taking the car over for the first time. He promptly tried turning some fast laps and found some very serious deficiencies in

(*Continued overleaf*)



Flames belch from Salvadori/Clark Aston in Mulsanne corner downshift.



No turning back. The start (left) of the longest race in the world. Albert Maher, shown at right with Briggs Cunningham, garnered a place on Corvette team merely by asking Alfred Momo if there was an opening. There was, and he helped refuel. Here they wait during night practice for number two Corvette.

the car's handling. Best Dan could do that night was around the 4'20" mark; he complained of unequal braking, too-soft suspension and a car most unstable on the Mulsanne straight. That was Thursday night, and practice was officially over. At midnight the following evening Dan and Walt were on the road trying the car in its final state after considerable effort had been put into making it handle. Pronouncing it noticeably better, the two drivers decided to race come hell or high water and the Cunningham entourage returned to their hotels, fingers crossed for the morrow.

Walt Hansgen started. He made a good getaway and the sleek Jag was soon screaming around the circuit until mechanical troubles set in. An injector pipe came loose and this plagued the car for hours. During the night with Dan at the wheel the trouble recurred and the car was in the pits almost every lap for a plug change. Eventual cause of retirement was a burned piston and the story of the car came to a close. Insufficient actual race testing on English circuits with either Hansgen or Gurney behind the wheel certainly contributed to the new Jaguar's poor showing. Six months from board to track isn't much and Coventry needed more time, time that wasn't available.

For the first time in years Ferry Porsche did not come to Le Mans. It was just as well for with the exception of the Abarth Carrera driven by Linge and Walter, the Stuttgart cars did very badly. Strangely enough, there was no one universal trouble to which they all succumbed. The Bonnier/G. Hill car had several troubles, strangest of which was a peculiar bump and momentary bang somewhere in the suspension. This usually occurred on the straight and, as Graham Hill related, was most unpleasant and disconcerting. The drivers had no idea what it was and their imaginations ran rampant. Eventually this car burned its copper gasket between cylinder and head; the mechanics sought to find out the extent of the damage on the spot and had the head off the engine in minutes, right in front of the pits, but to no avail. The Trintignant/Herrmann car damaged a piston and although the Barth/Seidel car finished in 12th place it had few gears left and limped over the line. De Beaufort and Stoop lost the hydraulic pump in the clutch-actuating mechanism, the first time such a failure had occurred.

The 1960 RS Porsche was slower than last year's car. In 1959 the best time in the RSK was a 4'17" lap while this year all that could be eked out was a 4'23". Increased drag from the required windshield was felt more by the smaller-displacement cars than by the big boys.

No less than 12 Ferraris started the race. Six of them finished, and two out of the six that retired did so for the most inexcusable reason: they ran out of gas! I happened to be on the spot when the Trips/Hill car coasted to a halt near Tertre Rouge. A wide-eyed Trips could not believe it, but the fuel pump was just not getting anything to pump and ran on – chattering merrily to itself. The car was in perfect condition otherwise and most probably could have finished the 24 hours without difficulty. The Scarfiotti/Rodriguez car conked out for exactly the same reason. And as the eventual winner, Olivier Gendebien, rushed towards White House on his last lap before handing over to Frere he felt the Ferrari begin to cut out. Gendebien actually coasted into the pits!

The reason for the error was apparently this: fuel consumption tests had been made during the practice session in April and the number of race laps that the team cars would be able to do was computed at that time. As it turned out, the pace in the opening laps was hotter than expected and without any kind of reserve tank on board the Ferraris were caught with their petrol down. This was

(*Continued on page 72*)

24 Hours of Le Mans

June 25 and 26
8.36 miles per lap

				miles	mph
1	Gendebien/ Frere	Ferrari		2620.7	109.2
2	Rodriguez/ Pilette	Ferrari		2587.3	107.8
3	Salvadori/ Clark	Aston Martin		2558.7	106.6
4	Tavano/ Loustel	Ferrari 250/GT		2520.3	105.2
5	Arents/ Connell	Ferrari 250/GT		2504.4	104.35
6	Elde/ Noblet	Ferrari 250/GT		2503.6	104.31
7	Hugus/ Pabst	Ferrari 250/GT		2498.0	104.08
8	Fitch/ Grossman	Corvette		2350.1	97.92
9	Baillie/ Fairman	Aston Martin		2349.3	97.89
10	*Lilley/ Gamble	Corvette		2307.7	96.16
11	Linge/ Walter	Porsche Carrera GTL		2249.3	
12	Barth/ Seidel	Porsche 1.5 RS60		2207.4	
13	Lund/ Escott	MG Twin Cam		2188.6	
14	Masson/ Laurent	Lotus Elite		2183.0	
15	*Ballisat/ Becquart	Triumph TRS		2149.0	
16	Wagstaff/ Marsh	Lotus Elite		2183.0	
17	Laureau/ Armagnac	D. B. Panhard		2116.1	
18	*Leston/ Rothschild	Triumph TRS		2115.6	
19	*Bolton/ Sanderson	Triumph TRS		2090.6	
20	Dalton/ Colgate	Austin-Healey Sprite		2055.2	
21	Lelong/ Van den Bruwaene	D. B. Panhard		2036.4	
22	*Wicky/ Gachnang	A. C. Bristol		2001.7	
23	Bentley/ Gordon	Osca 750		1982.1	
24	Bouharde/ Jaeger	D. B. Panhard		1906.5	
25	Bartholoni/ Saint-Aubin	D. B. Panhard		1865.1	

*Officially not classified; did not achieve required minimum distance.

Index of Performance

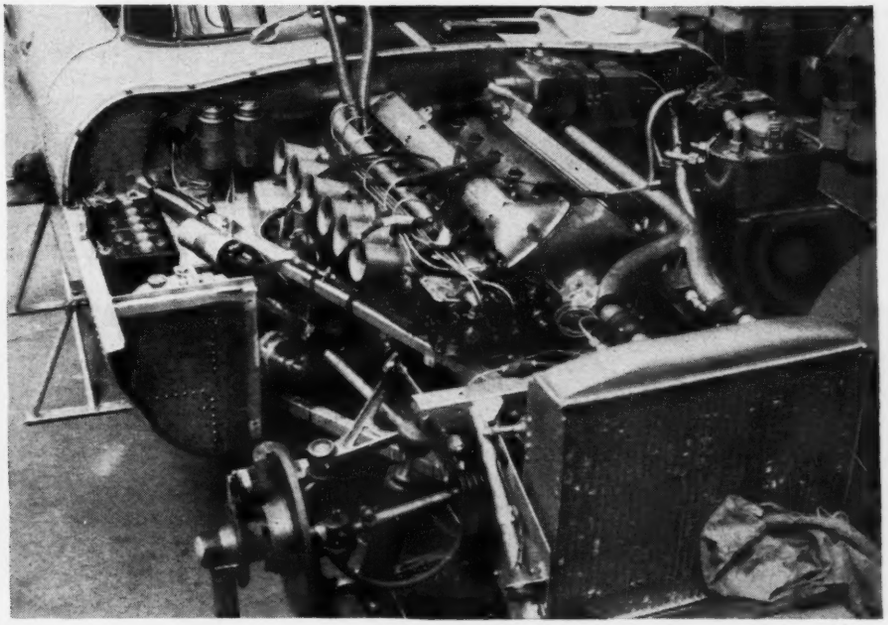
1	Laureau/ Armagnac	D. B. Panhard	1.257
2	Gendebien/ Frere	Ferrari	1.157
3	Bentley/ Gordon	Osca 750	1.151
4	Rodriguez/ Pilette	Ferrari	1.142
5	Lelong/ Van den Bruwaene	D. B. Panhard	1.130
6	Salvadori/ Clark	Aston Martin	1.128

Index of Energy

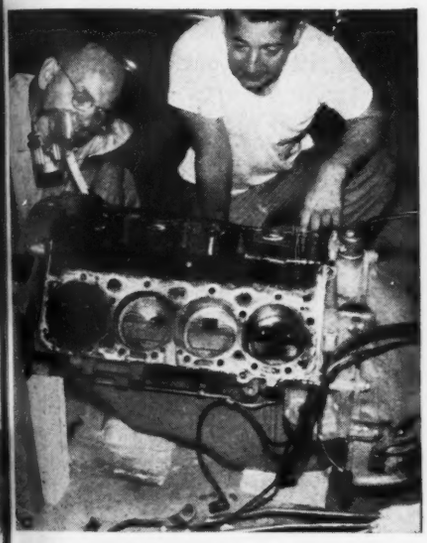
1	Wagstaff/ Marsh	Lotus Elite	1.15
2	Masson/ Laurent	Lotus Elite	1.02
3	Bouharde/ Jaeger	D. B. Panhard	0.97
4	Salvadori/ Clark	Aston Martin	0.94
5	Dalton/	Austin-Healey Sprite	0.94

Porsche sought to give roadsters a coupe effect by revamping the tail structure in line with regulations requiring high windshields.

A 250/GT California roadster version of this month's cover and Road Research Report car was driven by Bill Sturgis and Joe Schlesser. The only one of its type entered, it was retired Sunday afternoon.

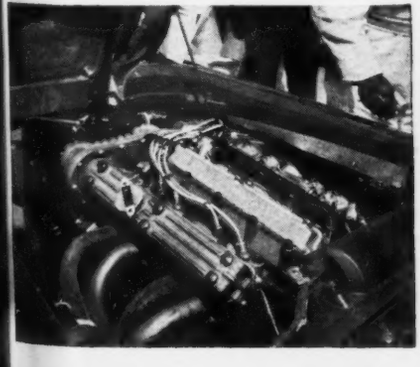


Only a few hours before the start, work continued on the Cunningham-entered Jaguar which features components evolved from the once-successful D-Type, including an alloy engine in body-cum-chassis.



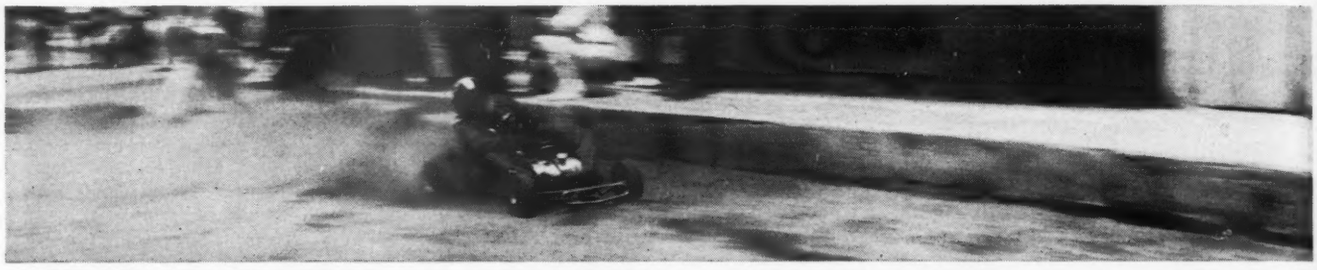
Creative destruction. G.M.'s Frank Burrell and tuner Bill Frick inspect Corvette engine which was deliberately blown up in practice session.

Twin-cam Triumph TRS differs slightly from version which appeared at Le Mans last year.



Paul Frere, who shared driving chores and winners' laurels with another Belgian, Olivier Gendebien, signals "seven" as he roars past the Ferrari pits; what he means by cryptic sign is anybody's guess.

Straightaway ran the better part of a mile down Tecate's main street. Karts passed each other on its 60-foot divided width at relative speed of 140 mph.



Granite-like curbs were higher than karts on some parts of the course. Trailing a dust plume, this kart piloto tries hard not to park it at the "curb".

Back leg of the circuit was unpaved, which led to wild experiments with tire-cutting tools to groove the best tread for running on dirt and pavement.

"You see you sorta have to go flat-out right up to the corner, then relax your right foot, then give it the hip." "Wait here a minute; I'll show you."

MEXICAN KART BLANCHE

by Griff Borgeson

Karts come of age after their first successful attempt at the grown-up sport of Continental-style around-the-houses long-haul road racing.

►"Nothing as thrilling since Auto Union vied with Mercedes," I told the Editor in an exuberant phone call at the conclusion of the first Tecate, Baja California, Kart Gran Premio.

"Oh, *come* now," he scoffed.

"Look. You're there and I'm here. I'm among the most jaded mass of racing experts you could ask for and they're all in a state of shock over what's happened. Karts are more than anyone has dreamed!"

Between a conception and its fulfillment lie many unknowns. Ex-Kurtis Kraft constructor Art Ingels's original conception of the kart back in 1957 was of a legitimate racing machine suited to adult use, built to approximately minimum dimensions and cost. Or, the most racing sport for the money.

Today there are at least 50,000 karts in active use in the U. S. and countless others elsewhere in the world. The good karts have all been designed and developed by racing people, on race courses, and not in drafting office and laboratory. Competition has consisted almost entirely of short-duration events on ovals of about 1/8-mile and on small road courses of about 3/10- to 5/10-mile. The somewhat abortive and anticlimactic kart feature held in conjunction with the last Nassau G.P. was a step in the deminiaturization of karting competition, in the recognition of karts as legitimate racing vehicles. *The* breakthrough took place last May 22 with the sport's first round-the-houses, through-the-town, 100-mile G.P.

Tecate is about 35 miles in an air line from San Diego but more like 55 via the narrow two-lane asphalt ribbon that lurches and careens over the Jamul and San Ysidro mountains in a tortuous parallel to the Mexican border. Once the exurbs of San Diego are cleared the country is mostly desolate but beautiful in an oak-and-sycamore-studded desert way. The village of about 4000 population lies at 1800-foot elevation and is ringed by mountains that approach 4000 feet in height above the sea. Isolated though it is, Tecate is located strategically between Mexicali (97 miles), Ensenada (72 miles) and Tijuana (33 miles). These are the major markets for the town's sole industry, beer. Here in the large *Cerveceria Cuauhtemoc* are brewed and bottled tart, dark Tecate and dry, light Carta-Blanca beers. Unlike many Mexican border towns Tecate, thanks to its isolation, is a typical quiet country village with no tradition of or interest in harpooning the *turista* from the north.

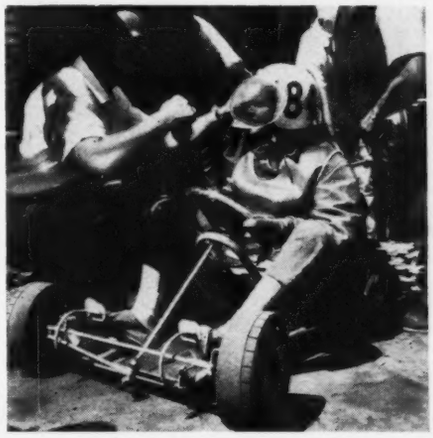
But Tecate does have its enterprising individuals who, a couple of years ago, saw civic benefit in inviting Southern California motorcycle clubs over to race. Having survived two visitations by the "sickel" fraternity and evidently having prospered modestly it followed that Tecate extended its hospitality to SoCal's new-fangled kart clubs. After two successful race meets on the airstrip outside of town Tecate placed itself, as we say in Mexico, between the sword and the wall, and either proposed or submitted to the now-historic and very significant 100-miler that took place on its very doorsteps.

That this would require the barricading of the highway and the suspension of all vehicular movement thereon for a period of about eight hours constituted no particular problem in the eyes of local bureaucracy. Putting the whole thing together was entrusted to Jerry Bielke of West Covina, who enlisted the indispensable aid of the Formula K Club of San Diego and the Cajon Karters of El Cajon, all these being Alta California towns. The date was announced, entries mailed.

Bug Engineering works team went to the races in style in bus top-heavy with karts. Machines were lowered to the ground with hand-cranked crane.

The event was going to be something entirely new in karting. Nassau's 50-miler offered some precedent but bore slight resemblance to what was in store at Tecate: pavement corrugated and rutted; surface largely dirt and sand; seven esses and 17 corners; a half-mile straightaway; almost as many hours at the wheel as in the Indianapolis "500" and probably scarcely less arduous; uncertain crowd control and safety precautions; course width varying from six to 60 feet.

This novel challenge was exciting but the predictions of race-wise, Tecate-wise *karteros* were gloomy. According to the announced starting procedure – in order of receipt of entry – all 50 or 100 could be expected to dive into Turn 12 simultaneously. There definitely could be no finishers. The race would be its own undoing and never would be repeated. It would, however, be a great experience for the survivors and a great tribute to the drivers and machines that lasted longest. Private entries flowed in but factory (who had the most to gain) team entries came in in sheaves.



Tecate race was one of the first kart features in which pit work counted. Here Faye Pierson takes on fuel and has her bubble shield washed.

Flanked by the Queens of Tecate, winner "Cub" Lyon has his hands full holding trophies. His mount was a jewel-like twin-engined Caretta.

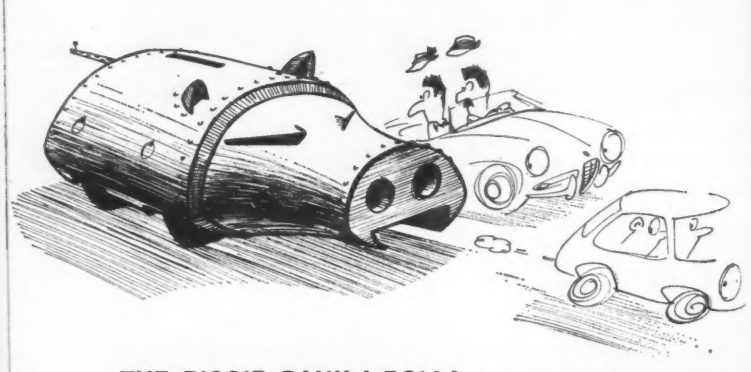
There were numerous aspects of preparation which never had to be considered in kart racing previously. The well-mastered art of two-cycle tuning was not a factor here, aside from minor adjustments to compensate for Tecate's elevation. Fuel capacity was an important

(*Continued on page 82*)

THE STUDIOS of Pignatelli Engineering are the hub of a tremendous industrial complex that produces the beautiful, dynamic Pigs. Here Pig stylists return to the basic shape for use as a springboard into the future. Enthusiasts the world over are trembling with expectation!

POIGNANT PIGNATELLI PRODUCTS

as told by Stan Mott



THE PIGGIE BANK-A-ROLLA is a familiar sight gunning by on Roman streets. First built for Italian banks, the Piggie became fashionable with the small Italian-American colony along with wide-brimmed white fedoras, striped suits and very heavy violin cases.

"How are Pignatellis designed?" was the inquiry made in a recent letter sent to the Pignatelli factory. The following is the reply received from Signor Pignatelli himself.

Dear Sir:

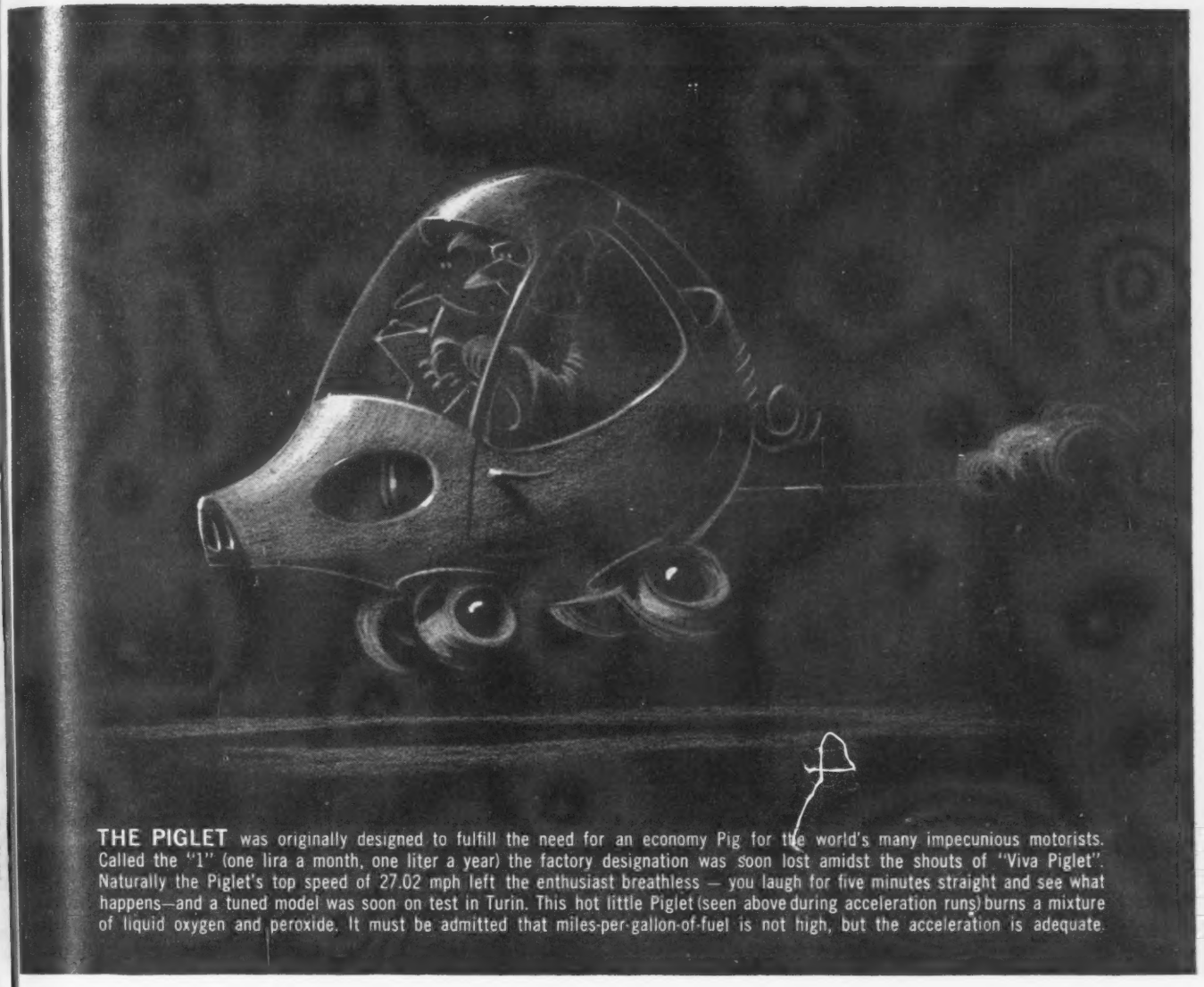
I shall reveal information about Pignatelli Products on two conditions:

1. That such information is printed in a publication devoted to the *true* automobile enthusiast. This is a precaution to keep our design secrets out of the hands of the Detroit manufacturers. (I have the feeling they have already plagiarized some of our past Pigs.)

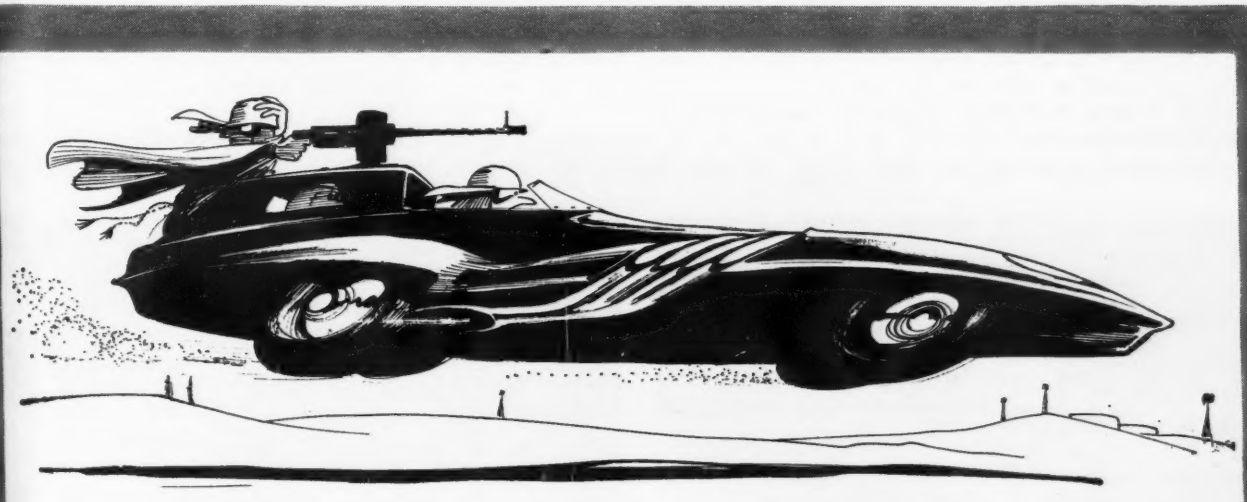
2. I will not send photographs. Cameras are not allowed in the Pignatelli factory ever since a fellow named Bill Taylorized approached me a few years ago and requested permission to photograph the cars for a travel magazine. I consented. The photographs showed up in a Hollywood scandal sheet in an article called "Pigs or Prostitutes?" (with black bars over the car's headlights.) I do not like cameras.

Sincerely,
S. Pignatelli

Mr. Pignatelli's terms were agreed upon. In response, the surrounding drawings and commentary were sent.



THE PIGLET was originally designed to fulfill the need for an economy Pig for the world's many impecunious motorists. Called the "1" (one lira a month, one liter a year) the factory designation was soon lost amidst the shouts of "Viva Piglet". Naturally the Piglet's top speed of 27.02 mph left the enthusiast breathless — you laugh for five minutes straight and see what happens—and a tuned model was soon on test in Turin. This hot little Piglet (seen above during acceleration runs) burns a mixture of liquid oxygen and peroxide. It must be admitted that miles-per-gallon-of-fuel is not high, but the acceleration is adequate.



PIGNATELLI DESERT LIMOUSINE bounds along over the sands as King Nascar and assorted satraps rush from one state function to another. This unique vehicle is an outstanding example of the versatility of the basic Pig competition model. It is built on a lengthened sports-racing chassis and is powered by two V12 engines driving one crankshaft. Weight with armor: six tons.

Porsche Prepares

by Dieter Korp

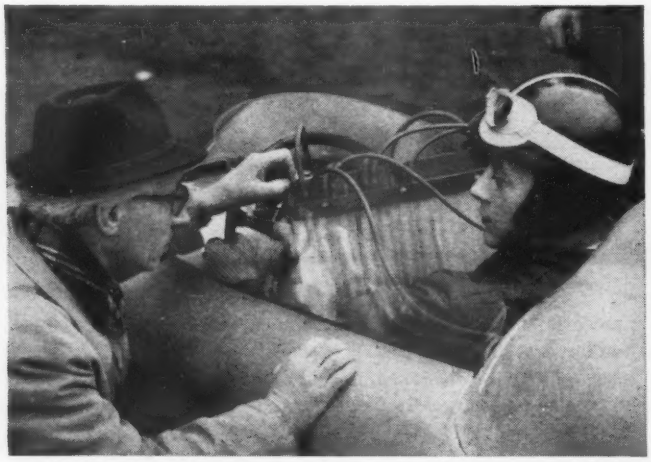
Today this Formula 2 Porsche expresses all the Grand Prix racing aims and ambitions of West Germany.

► Porsche's Formula 2 single-seater made its debut with a bang — it crashed into a wall at the 1959 Monaco G.P. In spite of this inauspicious start the first postwar monoposto Porsche has proved to be strong competition for the Coopers and Lotuses that were already firmly entrenched in the 1½-liter Grand Prix sub-formula. Perhaps most important, it's been solid proof-in-being of Germany's intent to back up its enthusiasm for the 1961 Grand Prix Formula with actual racing cars. For this reason, with an eye to the '61 racing calendar, it's time to back up SCI's track report on the Formula 2 Porsche (February, 1960) with a study in depth of this potent automobile.

The forerunner of the F.2, the RSK, earned its spurs on curvy, hilly race tracks like the Nürburgring. In 1957 during the German G.P. the RSK's mettle was made clear when Edgar Barth broke the "ten-minute barrier" in a full-sports-trim RSK with 2.2 seconds to spare. The occasion was Porsche's first start in Formula 2. The next year at the 'Ring, though the center-seat RSK hadn't yet become a genuine F.2 car, it seemed to handle much better. Barth drove it to second place in the Formula 2 class (behind Bruce McLaren's Cooper) and sixth overall in the Formula 1 race, setting a new lap record for the class at 9'42.8".

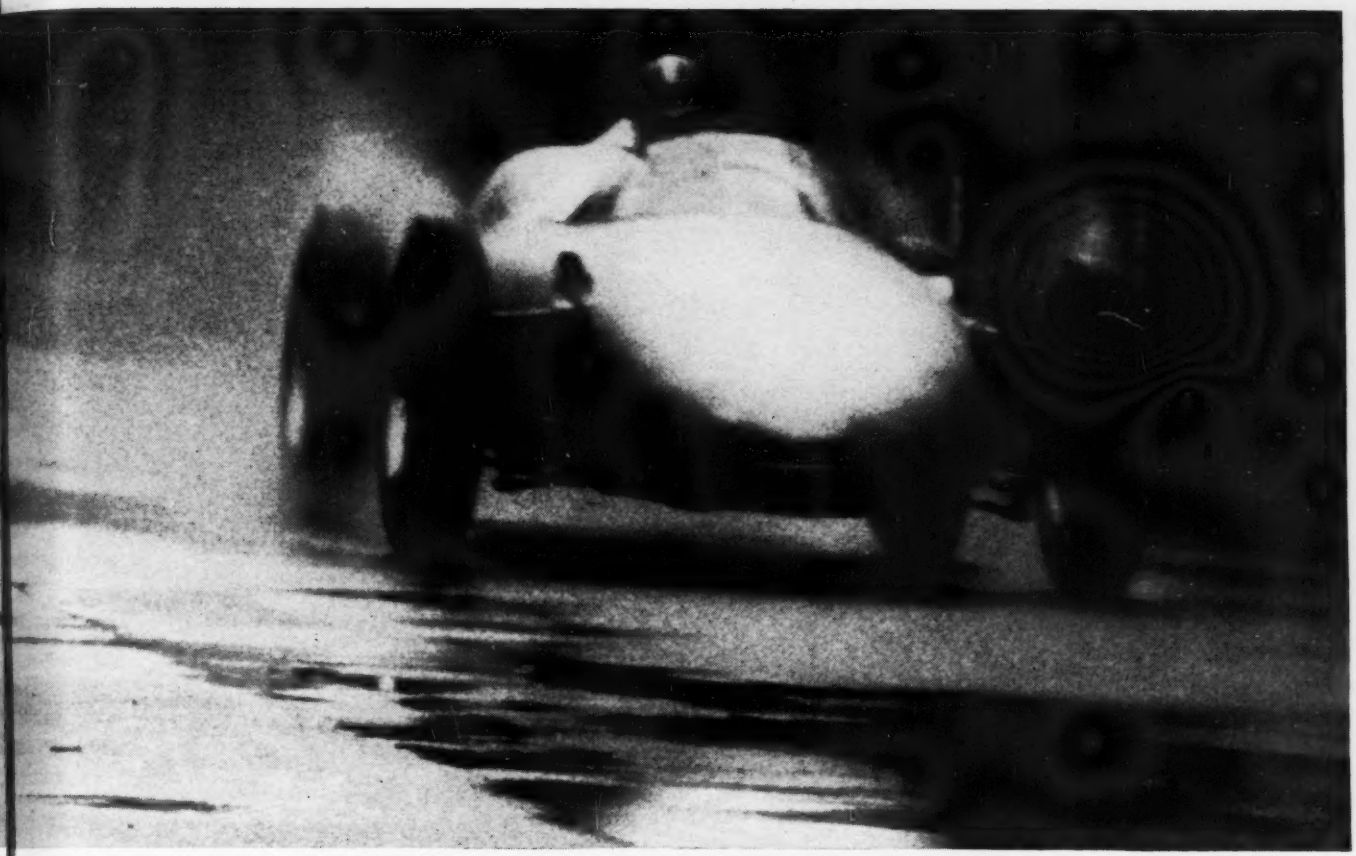
EARLY SETBACKS

Wolfgang von Trips was at the helm during the debacle at Monaco. He had set the fastest F.2 qualifying time of



Dr. Hild, Porsche engineer in charge of racing car development, made final check on aerodynamics of F.2 car with temporary bank of manometers.

In Hockenheim Ring tests back in February, Dr. Hild follows the single-seater in a Porsche coupe to get a first-hand view of its behavior.



A potent contender now, this car or a better one should keep the silver shining for Stuttgart in 1961.

the 16 contestants who were able to start, but the car was very badly damaged on the second-lap crackup. Later in '59 Joakim Bonnier took a Formula 2 third spot at Rheims, France, and probably could have done better had there not been unforseen complications with the carburetors. It seems that because of aerodynamic problems an unusually high pressure was developed right between the ram tubes of the Weber downdraft carbs. This induced the air correction jet, located right there, to produce too rich an air-fuel mixture. Changing to a smaller correction jet in an attempt to lean out the mixture took its toll in the form of reduced acceleration. The answer lay in changing the shape of the tail end and making changes in the internal air flow, details that have been effected in the 1960 F.2 machines.

Other mods for '60 include a slimmer nose and refinement of body details; a sturdier crankshaft (still built and completely assembled by Hirth) and a wheelbase lengthened by 4 inches. Interestingly, the first revised F.2 Porsche was entrusted to Rob Walker, hence to Stirling Moss, who had already tried the 1959 car at Goodwood and decided, "The best way to take care of this astonishing Porsche is to drive one yourself."

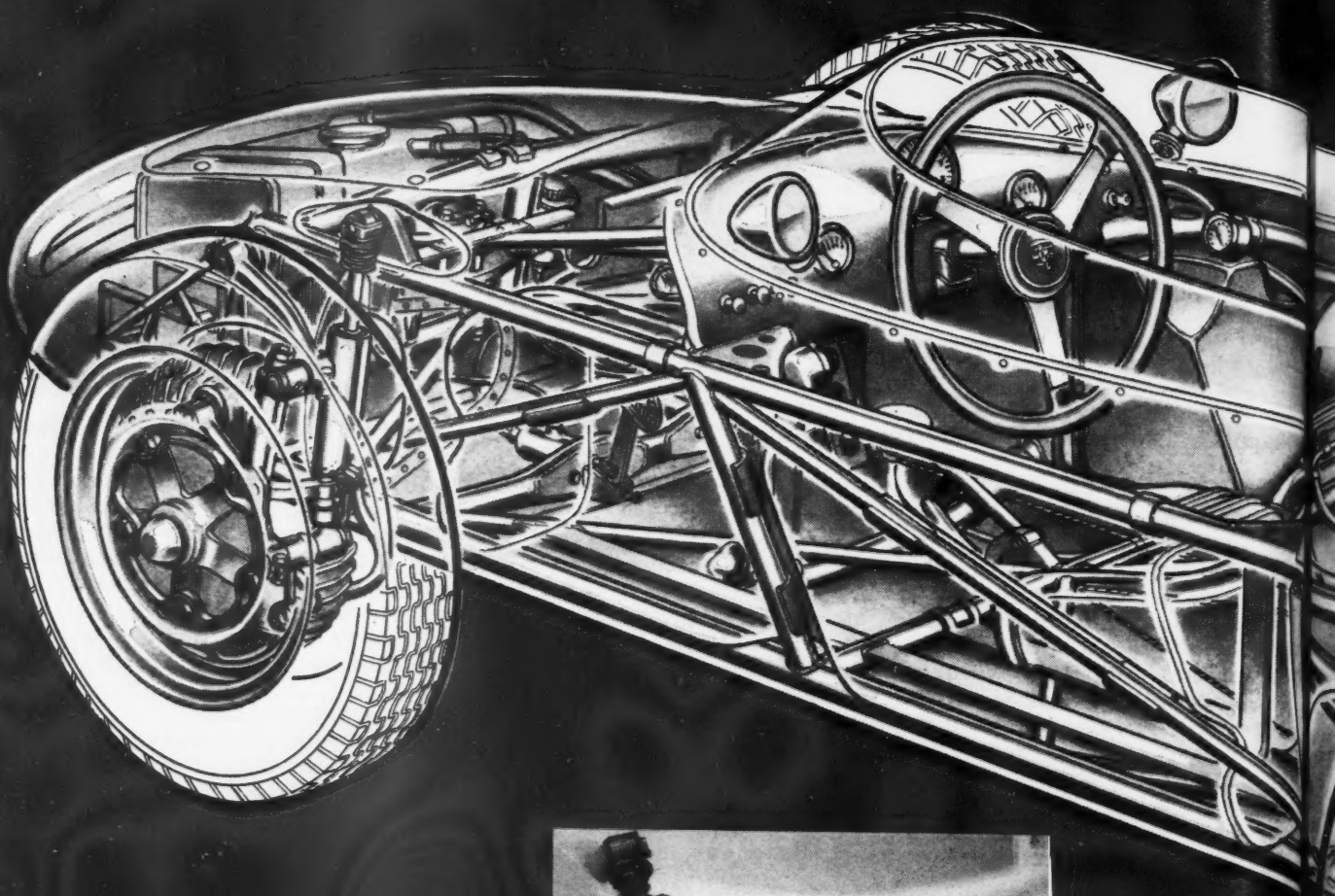
MOSS TAKES DELIVERY

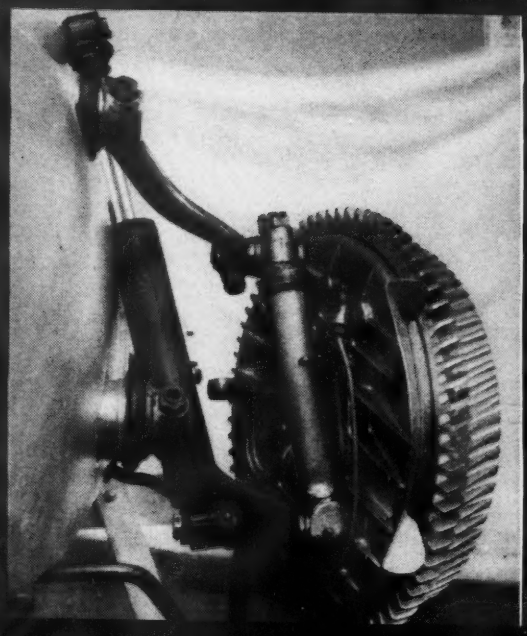
Our Weitmann photos show the gloomy morning in February when Alf Francis came down to the Hockenheim

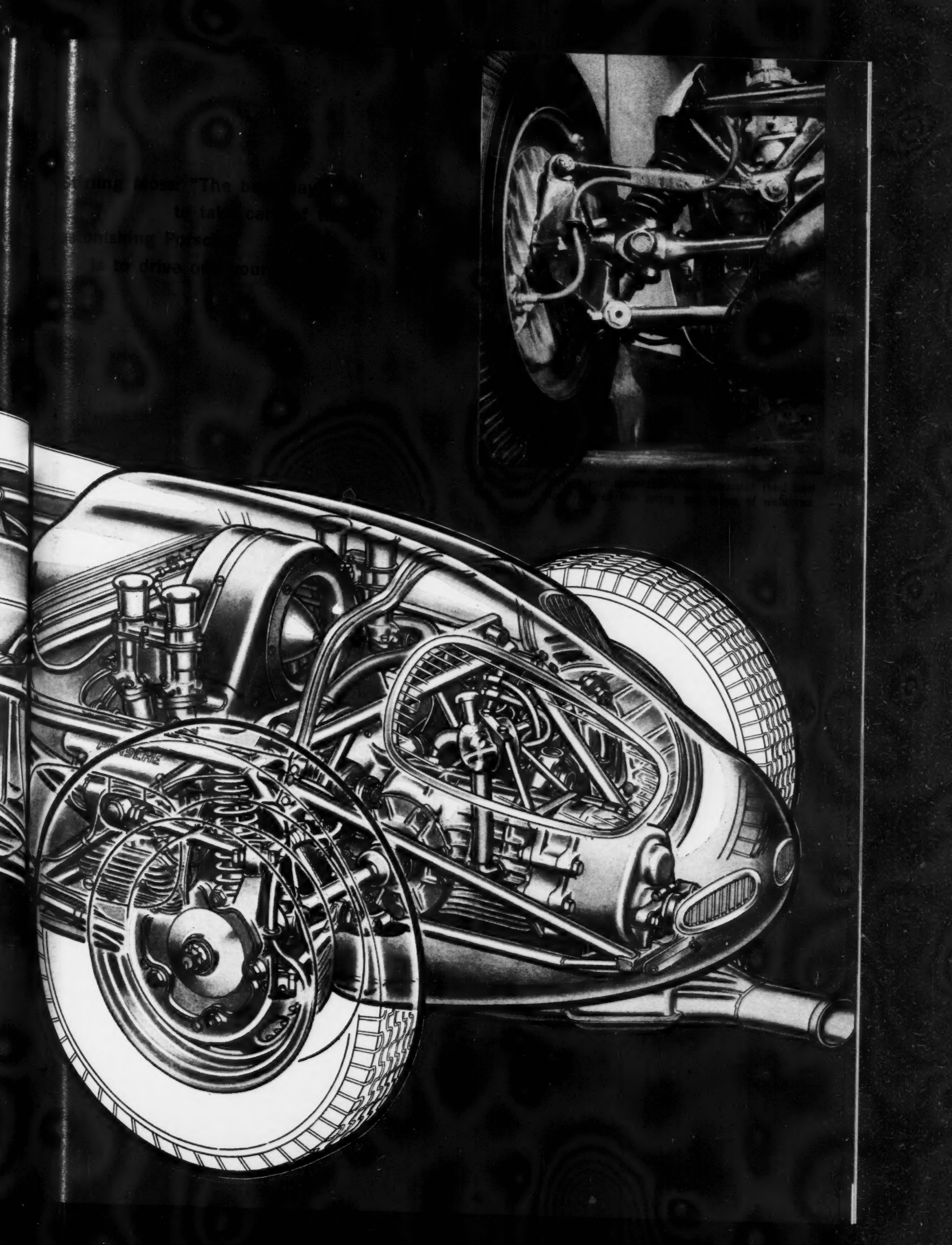
(Text continued on page 50; drawing overleaf)

"You mean I have to drive the car with all this stuff in here?" Test driver Herbert Mimmler doesn't seem resigned to his scientific duties.

Tufts of yarn were also attached to the back of the car to clarify air flow. Prime concern of engineers was flow to carbs and cooling blower.







track to observe the final tests and "take delivery" of the car. Under the direction of racing engineer Hild, the shape of the body was given a final check by means of pressure pickups and a bank of manometers. They were concerned not only with that carb air pressure problem but also with the avoidance of a low-pressure area near the air intakes to the cooling blower. Finally Hild and Alf were satisfied with the car and it was given the midnight blue paint job with white striping that's the trademark of Walker's stable — and his official racing color as a Scot.

Stirling's first race with the new car — with the whole Porsche factory including Ferry Porsche himself awaiting the results with great trepidation — was at Syracuse in Sicily on March 19th. He led the race against top opposition until almost half distance, setting a new Formula 2 lap record in the process, but was felled by a broken valve which did massive internal damage. Porsche was quick to explain that ATE, the valve manufacturer, had given them poorly-inspected production valves instead of special racing goods. We can be sure *that* won't happen again! Since Syracuse the F.2 car has lived up to the Porsche reputation for reliability in the hands of Graham Hill and Joakim Bonnier as well as the hard-driving Moss.

FRAME AND SUSPENSION

Let's take a closer look at the car. Back in 1959 the first single-seater was made much lighter than the Spyder not only in bodywork but in the frame as well, which could be simplified by removing the dips for doors. One would think that narrowing the frame would be an easy and logical matter, but in fact it was only made possible by the use of more sharply bent trailing arms for the front suspension. Only by doing this could weight and frontal area be substantially reduced. Ready to run, the entire chassis weighs about 920 pounds. Brake drums and brake backing plates are made of Elektron, a magnesium alloy, to reduce unsprung weight and to improve cooling. The light-alloy body weighs about 65 pounds.

Shown clearly in LaTourette's cutaway and an accompanying photo, the novel Porsche wishbone rear suspension has already been discussed in the February Track Report. It was created primarily to reduce changes in tread with wheel movement, to give the car a steadier feel at the back. This it seems to have accomplished. The layout was first tried experimentally as long ago as early 1956, when the space-framed RS sports car was being created. Again the track at Hockenheim was the arena for tests prior to the Mille Miglia that year, when Porsche settled on the low-pivot swing axle design. Another subtle suspension note is the slight negative camber given both *front* wheels. It could be that the "bite" at the back is so much improved that this change in the front was needed to preserve near-neutral steering. Fuel tanks are placed along both flanks of the body where they'll have a minimum effect on weight distribution.

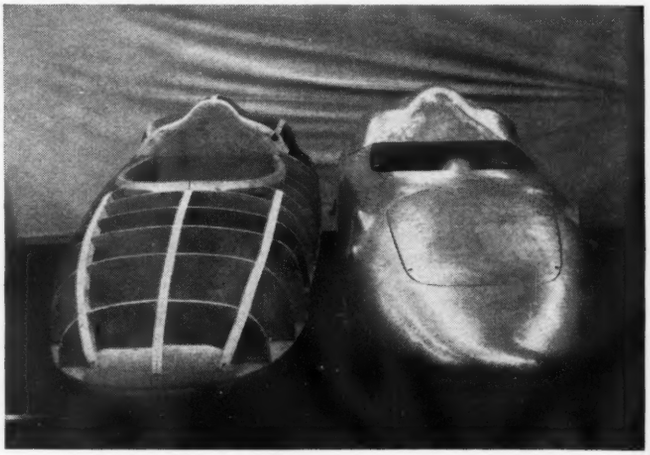
AIR-COOLED POWER

Dr. Ernst Fuhrmann, the designer of the type 547 four-cam engine, is no longer with Porsche, but his memory lingers on in the shape of one of the most remarkable racing powerplants in existence today. Except for the flat-four layout and a few mechanical details, the design was entirely new, but some interesting comparisons can be drawn with the standard pushrod Porsche engine, especially regarding the cooling system.

As the only air-cooled engine in serious contention for top racing honors today, the type 547 has obviously absorbed a lot of the know-how of the Porsche design staff. For example, the type 369 pushrod 1500 engine had a total of 2600 square inches of cooling fin area, and its single-entry blower absorbed 8.6 useful engine horsepower at a crankshaft speed of 5500 rpm. For the 547, which was to develop some 50 percent more power, the fins were broadened out to 3600 square inches. To supply nearly twice the air used on the 369, the blower was made a double-entry type, in which the air is able to flow into the radial blades from both front and rear. This was all made to balance out so nicely that at 7300 rpm the 547's blower absorbed only 8.8 horsepower. Porsche's calculations indicate that this amount of power is less than would be consumed in shoving a conventional radiator system through the air. On the Formula 2 car a small amount of air is fed through a conventional oil cooler up in the nose; there's been no further use of the skin-type oil cooler tried a few years ago.

When the four-cam engine was first announced, and when the first drawings were released and published, it could be seen that the intake valve was angled at 39 degrees to the vertical and the exhaust valve at 40 degrees, values that are generally in accord with modern practice. Oddly, though, the access plates over the valve gear were cut at

PHOTOGRAPHY: WEITMANN



Limited-production bodies like these are hand-made in the Porsche shops over wooden mockups similar to those employed by Italian coachbuilders.

right angles to each other, as they might have been had there been an angle of 90 degrees between the valves. The same layout was used on early 550s and Carreras, but was dropped before too long in favor of a cut that's at right angles to each valve stem. The earlier engines can be detected by a pair of ridges cast above and below the "PORSCHE" name on the intake cam covers, and by detail differences in the exhaust cam covers.

VALVES AND GEARING

The valves themselves are made by ATE, who is now presumably using better quality control than pertained before the debacle at Syracuse. Unlike the Carrera engines, which have sodium-cooled exhaust valves only, the racing engines use coolant in both intake and exhaust stems. Hardened fingers are interposed between cam lobe and valve stem, not directly between but with the valve stem at the finger tip and the cam contacting it along its middle so that a movement of the finger's adjustable pivot will affect the working clearance. Even more than in other racing engines, the valve clearances can be manipulated on the Porsche to get just the right valve timing. On the hottest versions the cam lobes are given an asymmetrical shape that leads one to think of wild timing diagrams, but the actual intent is to compensate for the exaggeration pro-

duced at certain positions of the cam by the shape and arrangement of the finger.

Harking back to techniques used on Auto Unions and on the Porsche-designed Cisitalia Grand Prix car, not to mention racing NSU cycle engines, the many cams are driven by a system of shafts and helical bevel gears. It takes a hard-won familiarity with the combinations of splines and gears in this layout to take advantage of the opportunities it offers for specialized valve timing — or even to get close to the figures specified by the factory. Each pair of cams (say the two intake lobes on the right bank) is carried in two aluminum-insert bearings which are just inboard of the lobes proper. From each bearing is an oil passage that communicates only with "its" cam lobe, the drillings and feed grooves being so arranged that oil is fed under pressure directly to the lobe only when it's actually working against the finger and stem.

MANY, MANY GEARS

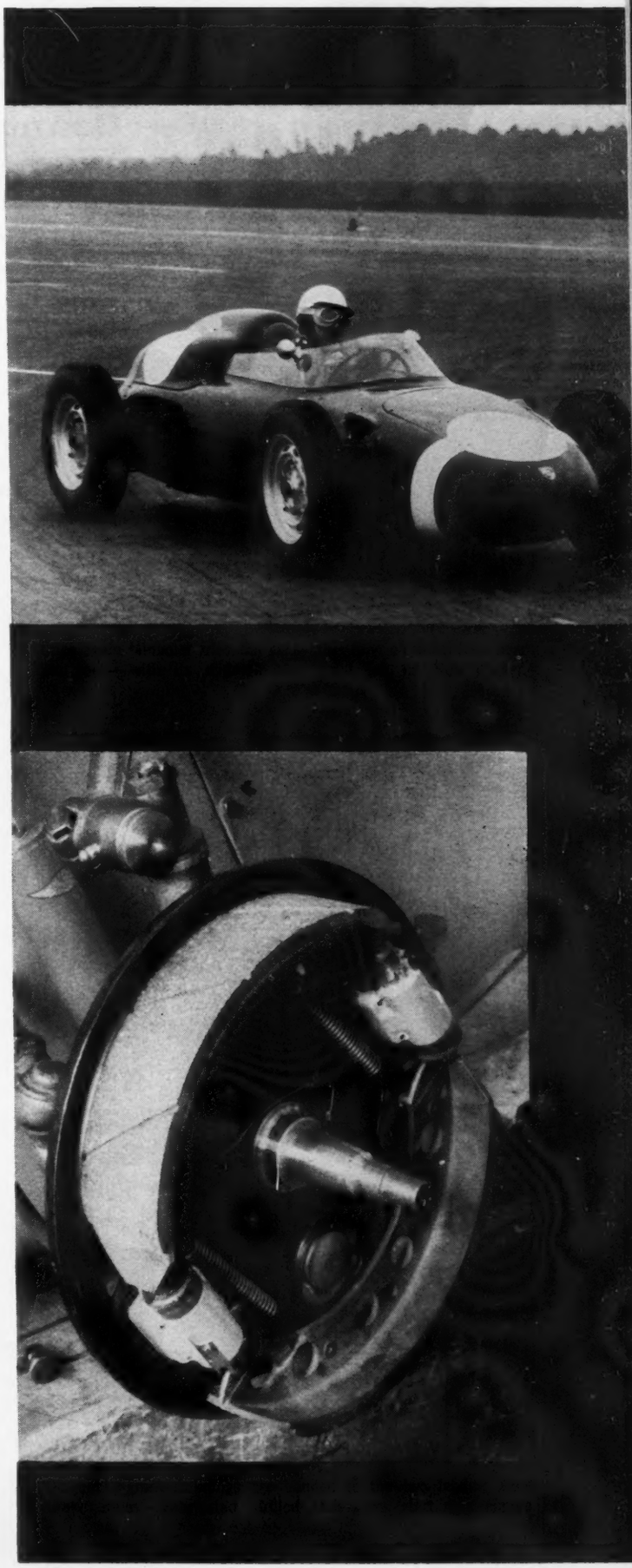
Carb sizes on the Porsche racing engines have expanded dramatically from the 40 mm downdraft units fitted to the first Spyders. The biggest tried were the 48 IDM Webers used on the Rob Walker Formula 2 car at Syracuse, from which they've backed down to the 46 DMP Webers for the current cars. These are very large bore sizes for 1500 cc engines — 40 mm used to be standard wear — but even the 46 mm of Porsche's latest isn't as big as the 50 mm side-draft carb being fitted to some Coventry Climax 1500s.

Anticipating a higher state of tune for the Formula 2 engine than they'd ever extracted from the four-cam before, Porsche designers decided on a six-speed gearbox for the single-seater. The idea is that more and closer ratios will allow the driver to keep the engine in that narrow range of rpm where it delivers useful power, but here, as in the case of the V16 B.R.M. a few years back, this kind of thinking runs head-on into the desires of the drivers. Road-racing types don't *mind* shifting gears, but they're not going around looking for extra work either. Stirling Moss found all the cogs so hard to sort out that he had Alf Francis install a special selector gate they had made for the old Moss Maserati, in which the lever is spring-loaded away from the first- and second-gear slots on the left of the gate (which is on the right side of the car).

Porsche was able to build the sixth speed into the existing five-speed type 718 gearbox by means of a simple expedient: leaving out reverse gear. This isn't in accord with F.I.A. rules for racing cars, but nobody has protested yet. The first and second gears are now both overhung in an extension from the back of the basic four-speed transmission case. The ZF-type limited-slip differential used in all Porsche racing machines departs interestingly from normal practice. Usually the sliding plungers that are at the heart of this differential slide in and out in a radial direction between inner and outer cams, but Porsche makes them slide side-to-side between left and right cams in a way that may produce a more compact differential unit.

As usual, the gearing is according to the circuit, both 7/31 and 6/31 ring and pinion sets being available for the final drive. For each gearbox ratio, from two to five alternate gear sets are available, so there's no need to lack a ratio for a critical corner. Tires usually worn are Continentals, 5.50 x 15 front and 6.00 x 15 rear.

No one knows yet how much truth there is to the rumors of radical 1½-liter racing engines from Porsche for the 1961 G.P. Formula, but if they do finally retire Fuhrmann's faithful four-cam it will certainly not be without honor. With the background they've gained with this car, the Porsche technicians should be able to take a leading position in top-line competition next year. —*DK*



DOLIN

Regular readers of SCI will probably recall some sparkling copy by European Editor Jesse Alexander that appeared in the August, 1959 issue anent the Grand Prix at Monte Carlo. These notes, backed up by a superb set of photos, described the short, happy life of a Formula 2 Porsche wielded by

Count Wolfgang Berghe von Trips

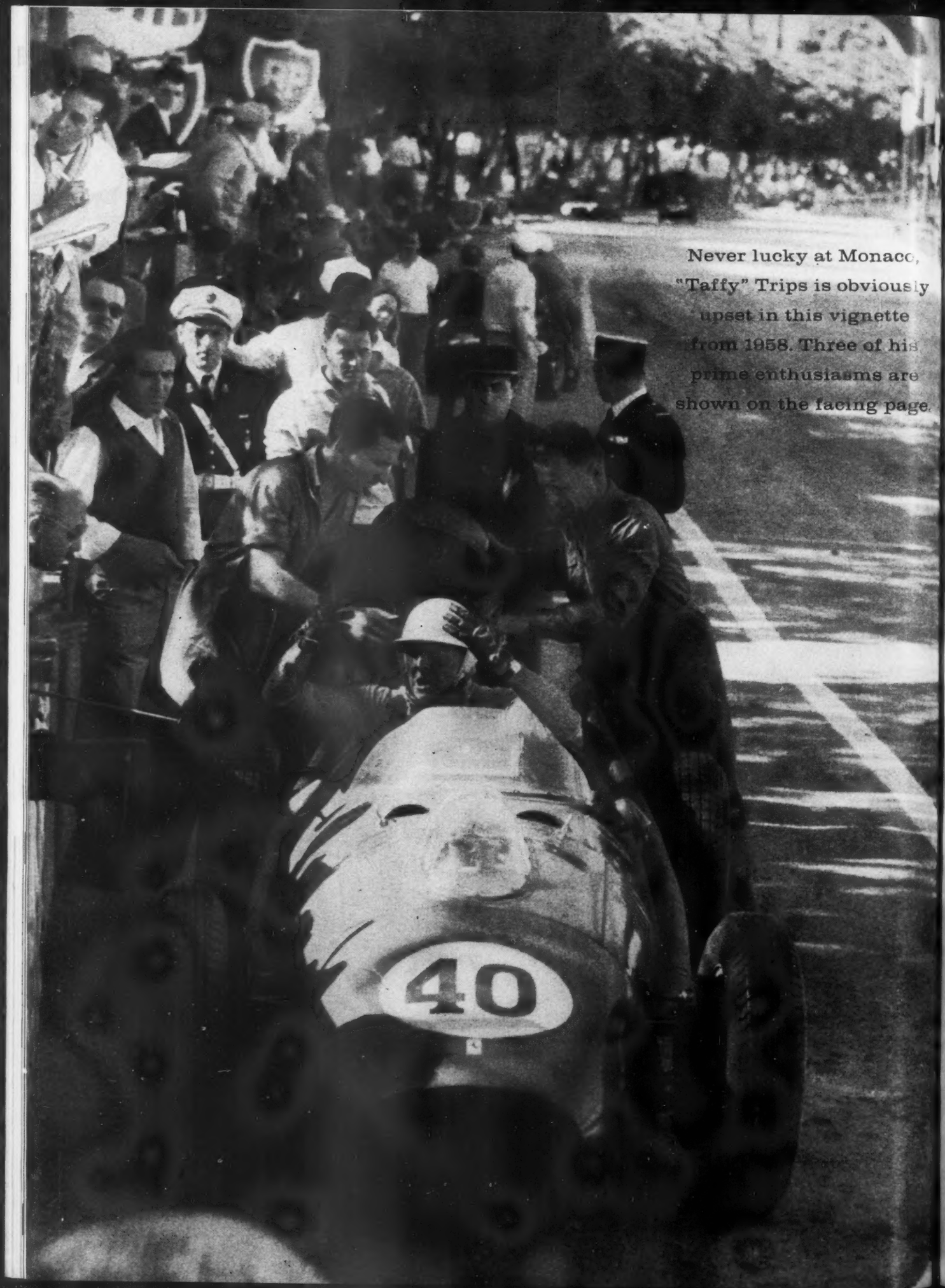
We quote: "The unfortunate shunt involving all three Formula 2 cars in the second lap of the race at San Devote corner was almost too much for those who had been at Monza last year. There, on the opening lap, von Trips initiated an accident at Lesmo, wiping out his Ferrari and seriously damaging Schell's B.R.M. This time Trips left the road at San Devote purely because he was too fast — certainly the track was slippery but it was bound to get a lot more slippery by the time 100 laps of the Grand Prix race had been completed. Starting around on the second lap and going very fast, Trips was up in the middle of the pack, well ahead of the other Formula 2 machinery. As he came out of San Devote and headed up the hill toward the Casino the car went wide, hooked a haybale and bent a wheel. The car was left with the tail sticking out on the course. Around the bend came Cliff Allison going like the hammers. He said later he saw the Porsche and realized he couldn't get by. He also realized he could easily hit the Trips car in the cockpit where Trips still sat so he opted for the haybales and the nose of the Porsche. No sooner had the dust and hay started to settle than Bruce Halford slammed his F.2 Lotus smack-dab in between the other two cars. The Formula 2 section of the first *Grande Epreuve* of the season had lasted exactly a lap and a quarter."

If Jesse thought that this was ". . . almost too much," it is only fair to speculate on his reaction at Sebring for the last *Grande Epreuve* of the season and its pell-mell first lap. Nobody in the pit area was aware of any incident on the course (the p.a. system was "mercifully silent" as a critical onlooker said), but when the field steamed up the short front chute and it was seen that Trips's Ferrari had suffered contusions of the nose while Tony Brooks pulled into the pits to inspect abrasions of the tail section, there was a concerted exclamation from the motoring journalists: "Well . . . he's done it again!"

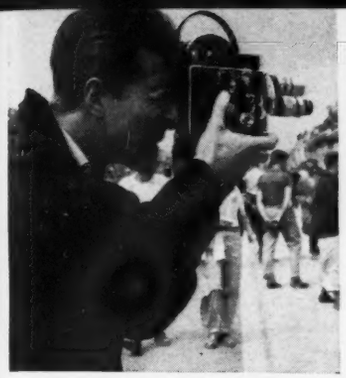
In all fairness, this is not a malicious attitude on the part of the press corps. The Count's brashness and his proclivity for going faster than someone else happens to be going at the time are two of those things that afford anecdotal material and offset the subliminal tension that grips the scene. Racing needs color and *(Continued overleaf)*

by Ocee Ritch

Looking less the playboy after a solid day's driving to second in the '57 Mille Miglia, Trips savors a flagon of wine.



Never lucky at Monaco, "Taffy" Trips is obviously upset in this vignette from 1958. Three of his prime enthusiasms are shown on the facing page.



"Taffy" von Trips splashes a lot of it around. In contrast to the austere, Puritan normality of the current crop of British drivers who, while sweeping the Championship list, never drink, smoke, or disagree with their wives over what's for supper and don't know what the inside of a night club looks like, the Rhineland nobleman exemplifies a totally different type of normality. As a handsome bachelor who has entranced a world-scattered legion of gorgeous dolls, von Trips races, parties, enjoys life to the fullest yet doesn't let these pastimes interfere with business. And, lest anyone think that he is not "a hell of a good driver," as Carroll Shelby phrases it, be advised that this man has the right to carve some pretty important victory notches in his trophy shelf. Many observers think that he could become a top-ranking driver if he campaigned regularly but the hawk-nosed blond has, so far at least, never put in a full season in either Formula or sports cars. Comparatively unheralded as far as the general public is concerned, Trips gets a lot of respect from those in the know.

He drove for Mercedes when the Unterturkheim plant was sending nothing but winners to the track (Stirling Moss, Karl Kling and Juan M. Fangio were his team-mates), and he has been under contract otherwise only to Porsche and Ferrari who aren't exactly backyard hotrodders. His performances when car and conditions permit are formidable . . . as several thousand witnesses to the transplanted Irish TT at Goodwood last year will attest.

DOLIN

Trips (with Jo Bonnier) in the 1.6-liter RSK stormed away from a gaggle of cars having double that displacement and finished a fantastic second overall, even giving winner S. Moss and his Aston Martin pit crew some anxious moments. British writers who don't see the Count on their tracks too often referred to this as the "race of his life." But this isn't exactly correct. Every race is the race of his life to Trips; the only difference is that he doesn't finish them all. To niche the youthful-looking Taffy properly, it is necessary to go back to the days immediately following W.W. II in Germany. There were few automobiles available to civilians and practically no spare parts but the 16-year-old Trips scrounged up a bombed Opel and succeeded in patching it up enough to get his family back to the Rhine, whence they had fled in front of the advancing Allies. Not only did the mechanically-minded Berghe coax the "Super Six" home, he kept it together for two years with baling wire.

WEITMANN

(Continued on page 78)

BMW 700 Coupe
and
NSU Sport Prinz

Stylized but not flamboyant, The BMW's interior features cloth and imitation leather seats, plastic door handles and neatly-laid-out dashboard.

► As different as two sides of a coin and just as close might sum up a comparison between the BMW 700 Coupe and the NSU Sport Prinz. The emergence of these two sporty cars approximately parallels the hardtop craze that swept this country. Each is based on a somewhat plainly-styled sedan and bears testimony to the increased standard of spending enjoyed by the post-war German middle class. They are representative of the host of chic minicoupes with which German manufacturers cater to their customers' fancy and the resurgence of West German auto touring throughout Europe. The two, imported by the Fadex Commercial Corp., have a number of elemental similarities, but these are highlighted by marked differences both in outward appearance and other less tangible attributes. To begin with, both are made in West Germany by companies very much wedded (through tooling investments, not to mention illustrious two-wheel achievements) to motorcycle-type powerplants.

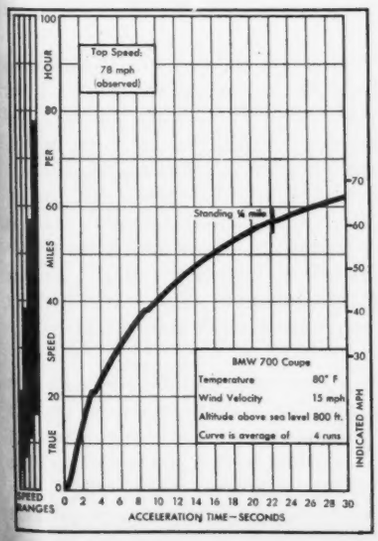
Both of the cars have two-cylinder, four-stroke air-cooled engines mounted at the rear. Practically bred on the *Autobahnen,* each has surprising top-gear celerity coupled with remarkable economy. The NSU is a vertical twin while BMW propulsion comes from a version of its opposed two-banger. There is a strong case for either cylinder layout. NSU proponents would claim their model makes use of an overhead cam economically feasible, simplifies cooling-air ducting and provides a more compact power unit. On the other hand, BMW boosters would point out that their layout provides a lower engine mounting, separates the two hot cylinders and is easier to balance. But, the NSU fancier would say, look at those long intake manifolds from the single carburetor and the engine's tendency to gyrate on a horizontal plane, both problems in a "boxer" layout. Not

ROAD TEST

BMW 700 COUPE

Price as tested: $1898 POE, East and West Coast

Importer: Fadex Commercial Corp.
487 Park Avenue
New York 22, New York



ENGINE:

Displacement	42.52 cu in, 697 cc
Dimensions	two cyl, 3.07 x 2.87 in
Compression Ratio	7.1 to one
Power (SAE)	35 bhp @ 5200 rpm
Torque	37 lb-ft @ 3400 rpm
Usable rpm Range	1200-6500 rpm
Piston Speed ÷ $\sqrt{s/b}$ @ rated power	2630 ft/min
Fuel Recommended	Regular
Mileage	29-36 mpg
Range	250-315 miles

CHASSIS:

Wheelbase	83.5 in
Tread, F, R	50, 47.2 in
Length	139.4 in
Suspension: F, ind., Dubonnet leading arms, coils; R, ind., single trailing arms, coils.	
Turns to Full Lock	1⅜
Tire Size	5.20 x 12
Swept Braking Area	155 sq in
Curb Weight (full tank)	1440 lbs
Percentage on Driving Wheels	59%
Test Weight	1740 lbs

DRIVE TRAIN:

Gear	Synchro?	Ratio	Step	Overall	Mph per 1000 rpm
Rev	No	3.45		18.75	3.2
			——		
1st	Yes	3.54		19.25	3.2
			83%		
2nd	Yes	1.94		10.54	5.8
			47%		
3rd	Yes	1.27		6.91	8.8
			53%		
4th	Yes	0.829		4.50	13.5

Final Drive Ratio 5.43

really problems, the BMW reply would be — look at the engine-rocking difficulties of the vertical twin and its need for very flexible motor mounts. Well, maybe so, but two vertical cylinders are easier to get at for routine maintenance. And so it would go. The answer? Flip a coin. Each layout has inherent compromises and compromises must be made no matter who's designing a car or how much you pay for it.

Neither car has a flywheel *per se*. Instead there is a dynastart unit, a schizophrenic electrical device that acts as both starter and generator, running directly off the crankshaft. Also crankshaft-driven is each car's cooling fan and contact breaker set. On each, the two spark plugs fire simultaneously each time a piston reaches the top of a stroke. (Naturally on the BMW, the "top" is the "side.") Only the cylinder filled with a fuel-air mixture will detonate for a power stroke. Neither car has a distributor as such but contacts control the surge of electricity to the two series-mounted ignition coils.

Both cars have four-speed all-synchromesh transmissions and tight turning circles, making traffic driving a cinch. However, the pedal layout on the NSU left staff testers wishing for more room between the controls, especially the steering column and clutch. Heel-and-toeing was possible on the BMW thanks to its organ-type accelerator, but no amount of contorting made it practical on the Prinz. The Prinz's clutch, too, engaged with a disconcerting violence, but like that on the 700 it did not slip, and the two engines showed a proclivity toward revving up fast.

The Sport Prinz and the 700 Coupe (like the Arabella and the DKW 750 tested last month) displayed that inherently German trait of having maximum cruising speeds identical to their top speeds. In both cars fourth gear is an overdrive and all-day flat-out touring is not out of the question. The only drawback (if the driver happens to be Detroit or British Isles-oriented) is that quite a bit of shifting is required for maximum performance. This was more noticeable on the NSU, which lacked the flexibility of the BMW. Shifting in each car required little effort, although the H-pattern wasn't particularly tight and there was free play in each gate.

Driving impressions of the two cars point up forcefully the essential differences between them. The NSU impressed us with its overall snug "Italian" feel while the BMW scored on creditable road handling for a sporty-type coupe. The Prinz's light and near-neutral handling characteristics made it possible to "wish" it around corners, seemingly without conscious movement. The BMW, an understeerer if there ever was one, could be blasted into a corner on almost any line provided you gave a strong enough yank on the wheel. A rain-swept track at Lime Rock didn't faze the BMW at all. We did manage to lift a front wheel, but the car felt secure at all times. With the Prinz, however, the drizzle made it touch and/or go all the way, but this may be due to tire differences. The BMW used Metzelers while the Prinz was shod with Continentals.

Neither car experienced wet ignition problems, but the windshield on the Prinz leaked in at least two places. Both cars had effective defrosters to keep the windshields mist-free and the heaters seemed adequate, although the outside temperature was far from chilly. The Italian feel of the Prinz stems from more than its Bertone body. The interior suggests the Alfa Giulietta coupe (another Bertone creation), and the hard bite of the clutch and considerable intermediate gear whine add weight to the impression that it is more Latin than Teuton in nature. Its quick steering encouraged driving *con brio* with arms and legs outstretched.

General overall quality of the BMW was at a very high level. While its little-box-on-a-bigger-box styling was less sporting than that of the Prinz, the driver could see all four fenders. The BMW too has a rear seat, but we would not recommend it for adults for any extended time. The shape of the BMW gave it a substantial edge in trunk space and the rear seat folds down to augment under-the-hood capacity. The rear portion of the NSU is intended primarily to add to the luggage space for two on a trip. The dashboard layout on the 700 carries a key-twist ignition switch, headlight switch, speedometer (on whose face are lights for the turn signals, high beam and charge indicators) windshield wiper knob and cigarette lighter. On the lower edge of the dash is a parking light switch. Two levers projecting from the steering column control headlight beams (left) and turn signals and horns (right). Choke and heater levers are mounted on the central spine alongside the driver.

A bedazzling array of lights, five in all, is the heart of the Prinz instrument cluster. Located below the speedometer, which is flanked by the wiper switch and a cigarette lighter plug, they are: high beams (blue), ignition (red), fuel (yellow), oil pressure (green) and direction signals (orange). Also on the panel are the headlight and ignition switches. Steering column levers control direction signals and, in four positions, high and low beams, headlight flasher and horn. The choke on the Prinz is also spine-mounted, ahead of the shift lever.

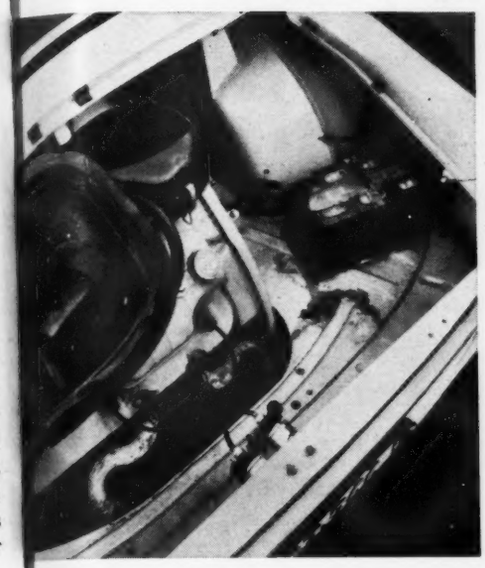
The NSU's interior had gotten somewhat shabby in its 8000-or-so miles before we tested it. The floor mats were more like scatter rugs and scatter they did every time the driver moved a foot. Its windows were hard to crank and there was a cacophony of squeaks and rattles, but at speed these were drowned out by engine noise. Each car had hinged rear quarter windows for draft-free ventilation. The NSU had a doored glove box and sturdy "sissy grip", mounted over the passenger's door. The BMW had an open glove box while the NSU supplemented its storage space with two generous-sized door pockets. Each car had adjustable seat backs. Thanks to steering wheels mounted in what leaned toward a bus-like plane, it was possible to drive with the seats far forward and still have knee room. Wide doors on both cars made entrance and exit easy.

The cars come equipped with tool kits, but the vista upon lifting the lid on either is enough to discourage all but the most incurable back-yard tinkerer. The NSU powerplant is dominated by what at first glance appears to be a cardboard box misplaced by the grocery boy. It's the cooling air inlet. The BMW unit is just as esoteric in appearance, since both power plants are extensively shrouded for their air cooling.

In August, 1959, SCI ran tests on the standard NSU Prinz and the BMW 600. Both of the cars currently tested show improvements over the earlier ones. The highly controversial front door of the 600 has been banished and a more traditional body configuration adopted. Performance over the entire range is also improved. The Sport Prinz, by definition, should be expected to outperform the Prinz — and it does, with its higher compression ratio and ten more horsepower. With its G.T.-style body it trailed the BMW off the mark, but exceeded it at the top end. The BMW's extra torque and displacement apparently offset the weight handicap it carries.

Heads or tails. Flipping a coin may not be the scientific way to decide whether to get a Sport Prinz or a 700, but it's not a bad bet. Both have been designed for the would-be sports car owner who finds he must have a shade more space and such amenities as roll-up windows. Both offer high-caliber touring performance in neat, stylish packages without the need to cart a bushelful of dollars when you buy or each time you tank up. —*SCI*

PHOTOGRAPHY: DOLIN



Unorthodox engine layout in NSU is dominated by air inlet duct. Note dipstick location in the duct and the small, tidy 12-volt plastic battery.

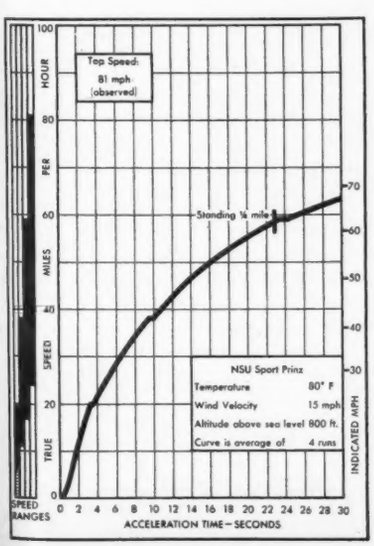
Form vs. function. The NSU has a lower, racier hood line thanks to inclined spare. BMW scores with more cargo space by mounting spare upright.

ROAD TEST

NSU SPORT PRINZ

Price as tested: $2200 POE, East and West Coast

Importer: Fadex Commercial Corp.
487 Park Avenue
New York 22, New York



ENGINE:

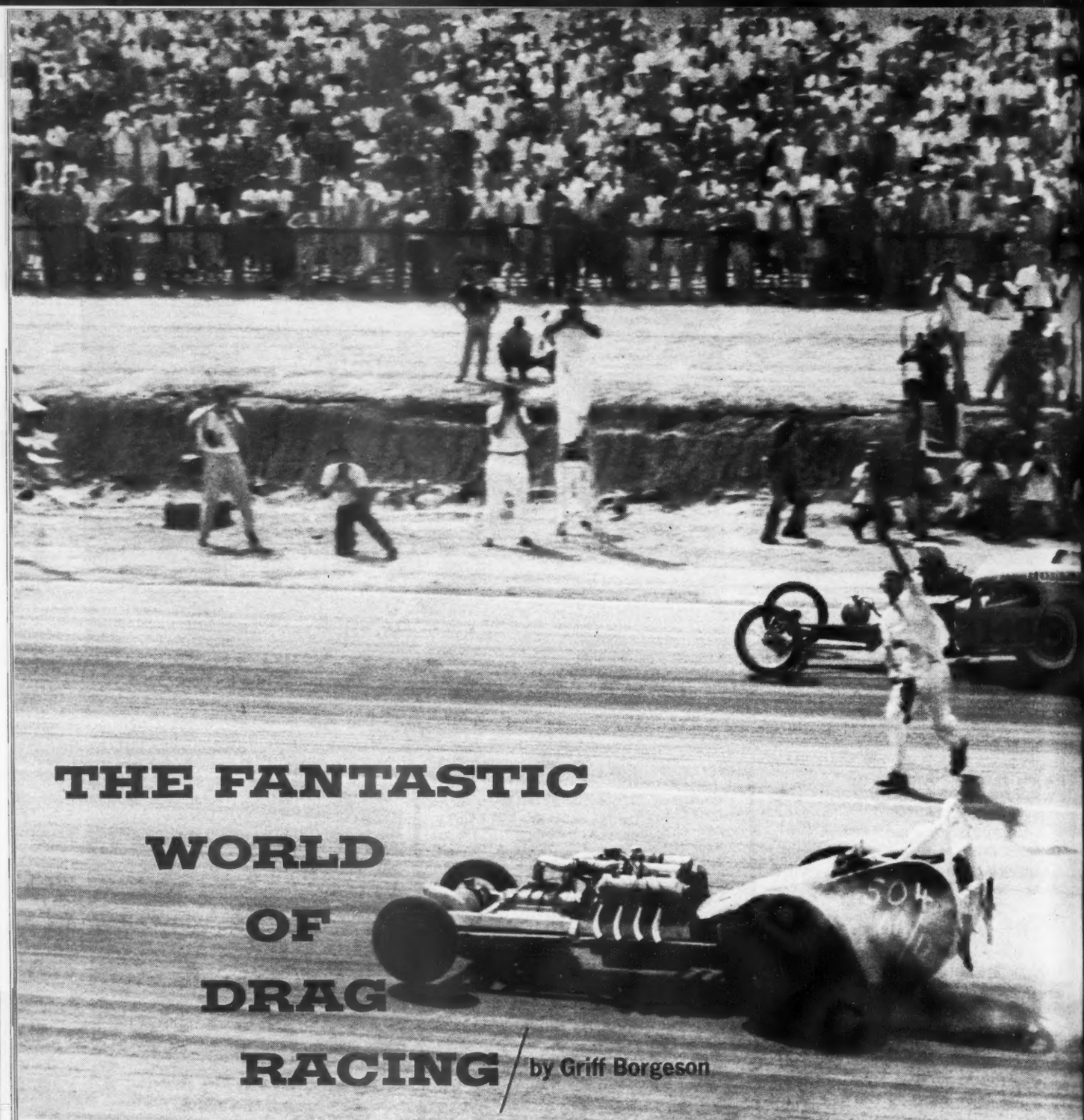
Displacement	35.6 cu in, 583 cc
Dimensions	two cyl, 2.96 x 2.60 in
Compression Ratio	7.2 to one
Power (SAE)	36 bhp @ 5500 rpm
Torque	31 lb-ft @ 3000 rpm
Usable rpm Range	1900-6500 rpm
Piston Speed $\div \sqrt{s/b}$ @ rated power	2550 ft/min
Fuel Recommended	Regular
Mileage	27-37 mpg
Range	180-245 miles

CHASSIS:

Wheelbase	78¼ in
Tread F, R	47¼ in
Length	141 in
Suspension: F, ind., wishbones, coils; R, ind., angled wishbone, coils.	
Turns to Full Lock	1 1/6
Tire Size	4.40 x 12
Swept Braking Area	104 sq in
Curb Weight (full tank)	1226 lbs
Percentage on Driving Wheels	60%
Test Weight	1540 lbs

DRIVE TRAIN:

Gear	Synchro?	Ratio	Step	Overall	Mph per 1000 rpm
Rev	No	5.38		25.65	2.4
			87%		
1st	Yes	4.14		19.75	3.1
			57%		
2nd	Yes	2.21		10.59	5.8
			41%		
3rd	Yes	1.413		6.76	9.1
4th	Yes	1.00		4.78	12.8
Final Drive Ratio		4.78			



THE FANTASTIC WORLD OF DRAG RACING

by Griff Borgeson

Ten brief years ago, zero to 100 mph in 1320 feet was fast. Today the speed has doubled and there's no end in sight. Skyrocketing progress like this has been a byproduct of a kind of car competition uniquely American in growth and scope if not in origin (the British have been doing this for years; they call it "sprint racing"). In its coverage of American standing-start record attempts SCI has touched on drag racing before, but this is our first full-scale introduction to this staggering sport. First, read Griff Borgeson's broad-based survey of the world of drags. Next absorb Dic Van der Feen's appraisal of The Chizler — the typical dragster whose atypical accomplishments are the key to this exposition. Finally, see how these cars relate to your own in Roger Huntington's acute analysis of the zero-to-sixty time.

CHANDLER

► "It can't be done!"

Many experts went on record to this effect when it was suggested that Rosemeyer's Auto Union world's record for acceleration was beatable. Engineers who had seen Bernd catapult down the narrow Frankfurt-Darmstadt autobahn in a greasy blue cloud of tire smoke were not reluctant to state that there was a limit to the amount of torque that could be applied to pavement via rubber tires and that Rosemeyer's feat included the achievement of that limit.

That was in 1937, over a decade before the first stirrings of the native American sport of drag racing. Drivers of automobiles had always challenged each other in acceleration contests but top-speed meets held in the late '40s on the dry lakes of the Mojave Desert seem to have provided the conditions from which organized drag racing was to grow. At the lakes the problem was to accelerate as quickly as possible and to the highest possible speed before entering the timing traps. As the arts of engine and chassis tuning improved, acceleration contests became commonplace on more accessible local streets. This illegal activity contained the seeds of its own early demise and, in 1949, a remedy was found in the form of the first legal, off-the-streets, organized acceleration trials on pavement. This was at Goleta, California, on the air strip where the Santa Barbara sports car races still take place.

It was a happy, healthy concept and soon vacant air strips up and down the West Coast were being used for legal acceleration trials each Sunday. The second to be organized, and one of the most influential in the history of the sport, was C. J. Hart's Santa Ana Drag Strip. As today, the course distance was a quarter-mile, 1320 feet. In order to determine the contestants' top speeds at the end of the distance, a 132-foot timing trap was set up straddling the finish line, 66 feet on each side. The time required to cover this short trap was converted into mph and was, and still is, the measure of terminal speed. Although a few intellectuals within the sport realized and argued that elapsed time (e.t.) was *the* determining factor in acceleration, top time (t.t., meaning top speed) for years continued to be the universally-accepted criterion.

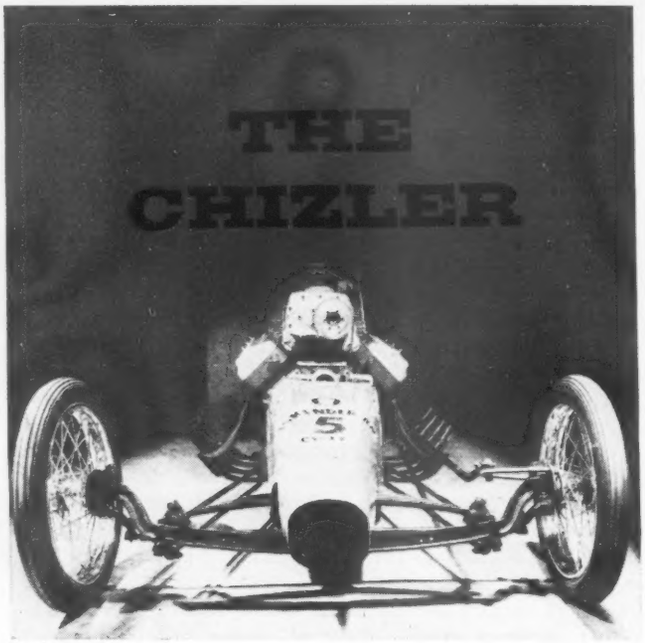
At the first Santa Ana meet the winner, Jim Woods, clocked a t.t. of 99 mph. That was on July 1, 1950 and on July 30 Chet Herbert of roller-tappet cam and Bonneville fame was the first to vault the 100 mph hurdle. He did this on a modified Harley Davidson at 103 mph. Herbert kept going faster and on June 3, 1951 he clocked an all-time high of 135 mph in the quarter. Calvin Rice, who was destined to break the Auto Union world's record for acceleration six years later, managed to turn 131 mph in a modified roadster.

Although Olds and Cad rocker-arm engines already were plentiful, this was still the flathead Ford-Merc era. When the 140-mph barrier finally was penetrated on November 8, 1953 by Maiwald and Callahan, it was done with an ohv Cad.

This achievement triggered the ohv-engine stampede although the Chrysler hemispherical combustion chamber engine was still overlooked. This is particularly notable because at the time everyone was running methanol and nitromethane, on which the Chrysler thrives. For more than a year and a half no one could get beyond 144 mph in the quarter. Then in July, 1955, Lloyd Scott appeared with his twin-engine Bustle Bomb — Olds in the rear, Cad in the front — and turned 151 mph his first time out. On gas. Gasoline was rediscovered and Scott proved that the key to gobs of acceleration was gobs of horsepower.

Theoretical articles had begun appearing in print in which the limits of acceleration within the quarter mile were

(*Continued on page 86*)



by Dic Van der Feen

► The past tense can now be used in discussing "two hundred miles per hour in the quarter." The figure was suddenly and wholly unexpectedly smashed earlier this year by a machine called "The Chizler," and the chances are — as with track's four-minute mile — that the 200 mph velocity will be reached again and again at drag strips now that the mark has fallen.

It has fallen but has not been cheapened. It's still an incredible rate of speed to reach in 1320 feet. No one has come closer to The Chizler's mark than the durable dragster of Don Garlits. The former record-holder from Tampa, Florida came to Alton a few weeks after the Chizler run and turned on one time of almost exactly 200, but found the perfect balance of conditions missing on his later tries and was unable to claim the mark officially. On the same day, The Chizler moved the official record way up and within easy reach of the double-century mark by recording three runs over 191. The newly-set, fully-accredited figure was 193.54 mph with an e.t. of 8.80 seconds. In one of those intriguing inconsistencies of dragging (discussed in Roger Huntington's story, this issue) The Chizler had a better e.t. of 8.39 but a lower velocity in runs at Tucson last March.

In special drags at Riverside, long-chassis (not 200-mph) version of The Chizler consistently eliminated top-quality West Coast machinery.

Fortunately for SCI's first full study of drag racing equipment, the car that did this brain-boggling thing is very nearly the standard tool of its trade. Much ingenuity and effort has been devoted to its refinement, but the basic elements are completely typical of the modern American "sprint special."

MODIFIED "STOCK" FRAME

The Chizler's frame is essentially a straightforward and extremely rigid twin-tube type, a modification of the noted Chassis Research TE-440 model. The two main tubes are three inches in diameter, and, like all the frame's tubes, are SAE 1020 steel. Parallel at the rear and twenty inches apart, they run forward to the firewall. Here, a major modification of the Chassis Research design breaks the tubes from a parallel relationship so that they angle toward each other, meeting at the front spring. Another modification, contrary to general dragster practice, is the relocation of two 1½-inch-diameter tubes from a reinforcing position above the main tubes to a suspended position just below them. These lighter-stock members on The Chizler run from a point opposite the rear wheels to the central gathering point at the front.

The roll cage is the high superstructure of tubular steel rising in twin fore-and-aft hoops from the firewall to the high point above the seating position and well to the rear of the back wheels. It is made up of 1¾-inch steel tubing. Generally following Chassis Research lines, it has also been extensively modified by Al's Speed Shop. It is welded to the main tubes at eight points and, of course, provides outstanding additional chassis stiffening.

STANDARD DRAGSTER POWER

To The Chizler's 1957 Chrysler block a 1951 Chrysler oil pan is bolted to gain the advantage of the rear oil pickup, a vital consideration with the oil surge under acceleration. On top, 1954 or 1955 Chrysler heads are fitted in order to get their fine hemispheric combustion chambers. These heads carry valves of 1 15/16-inch (intake) and 1⅝-inch (exhaust). The poppets are highly polished but otherwise unmodified and the 45-degree seats are retained. The heads are extensively ported, polished, and cleaned out behind the valves but are not milled.

Actuating these valves is an Iskenderian kit based on a development of Isky's "5-Cycle" camshaft, an experimental design which uses roller tappets, stiff valve springs, and special pushrods. This Isky camshaft is almost in the "impossible" category. The grind features a very fast opening ramp with extremely blunt lobe tips that permit the entry of an enormous fuel-air charge from the big GMC 6-71 supercharger.

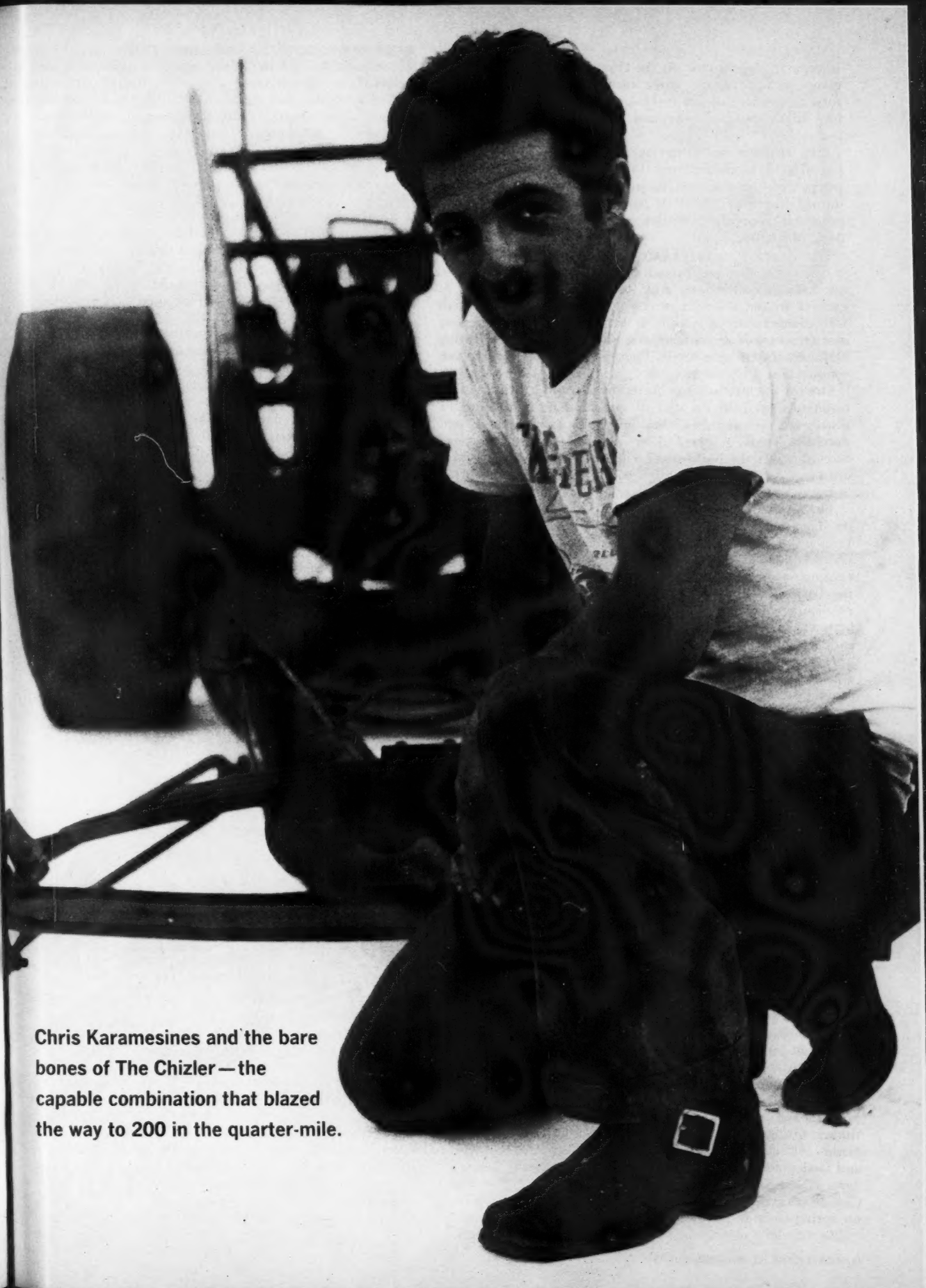
BLOWER REFINEMENTS

Running often in excess of 7000 rpm. the blower's center spacer plate needs beefing up. Cracks are common around the shaft bosses unless this is done. Scoring is also a problem with the stock plate when the blower is operated at speeds so far above its design intentions. Weiand supplies a replacement plate with hefty half-inch bosses and thick stiffening ribs, to correct this. and also provides the blower manifold, a simple plenum chamber.

The supercharger drive is an Iskenderian kit comprising brackets, belt tensioner, two pulleys and a wire-reinforced Gilmer belt. The outsider easily foresees difficulties with this exposed and overly-simple installation, considering the awesome job it is called upon to do. In actual fact, few components on the vehicle are as trouble-free as the supercharger drive. The single tensioner is entirely adequate, belt-throwing is almost unknown, and belt life seems to have no limit.

The scoop above the blower rests directly on top of twin

(*Continued overleaf*)



Chris Karamesines and the bare bones of The Chizler—the capable combination that blazed the way to 200 in the quarter-mile.

injector intake throats. At the chromed butterfly shaft these giants measure nearly three inches in diameter, giving a total throat area of nearly 14 square inches. An alternative, four-throat setup is sometimes used which gives 30 square inches!

The Hilborn fuel injection entering the picture at this point is the standard unit for supercharger use with 40 percent of the fuel fed in at the intake throats to pass through the blower and 60 percent directed into the eight ports via individual nozzles. The metering is constant-flow, of course.

INTERNAL INTEREST

Inside the engine, interesting Grant-built forged pistons are used. As shown on page 65, they have a number of grooves around the skirt to retain oil. Before such a design was commercially available, it was necessary to cut your own grooves or to Nurlize the skirts. Stock semi-floating GMC wrist pins are used. The pistons leave the 8-to-one compression ratio unchanged.

Fire for the mixture is delivered by a Hunt Scintilla Vertex magneto driven off the rear of the camshaft in the former distributor position. Champion 53T spark plugs are normally used. A skew drive at the Hilborn accessory take-off drives the fuel injection pump. No radiator is used on The Chizler and the sealed cooling system is filled with ordinary water, an ancient practice in straightaway racing.

The entire clutch unit is from the Schiefer Mfg. Co. As The Chizler is a "high-gear-only" proposition the advantages of a double-disc clutch unit can be exploited, with no need to shift gears once your foot is down. With enormous torque to be harnessed, two clutch discs double the friction area and give heat twice the mass in which to dissipate. Heart of the unit is an intermediate plate between the two clutch facings, known as a "floater disc" and weighing about 2½ pounds in aluminum. The flywheel, also from Schiefer, is likewise aluminum and features a sintered-bronze Velvetouch facing. The pressure plate is similar. The entire unit is surrounded for safety's sake by a full 360-degree shield of ¼-inch steel. A hoop in the firewall accomodates this.

The drive is taken through a short fabricated shaft and a single universal to a modified Oldsmobile rear end, narrowed to 38 inches. This is one of the major departures of The Chizler from common practice among today's fuel dragsters. Most use a Halibrand rear end, but The Chizler's exponents have stuck with the trouble-free Olds unit at a considerable saving in cost. The shaft splines are re-cut and the ball-bearing hubs are retained though roller bearings are generally used by others. Don Maynard, The Chizler's chief mechanic, feels that over 160 mph the lower resistance of the balls can add as many as four miles per hour.

CHASSIS AND BRAKING

The 1932 Ford dropped front axle is supported by a Model A leaf spring. All steering components are specially fabricated with aircraft fittings throughout. The total steering lock is 1¼ turns. The front wheels are specially made by the Chizler's sponsor, Al Thompson, in Aurora, Illinois. He ties 3.00 x 19 motorcycle rims and 40 spokes to his own aluminum hubs and mounts John Bull tires, imported from England.

The monumental rear wheels, 9.00 x 16, are special Halibrand magnesium castings carrying slicks made by the M & H Tire Company, Watertown, Mass. These synthetic rubber brutes last about 120 quarter-mile runs, and cost about $80 each. Front shock absorbers are friction-type, and were made up by Karamesines and Maynard at Young's Auto House in Chicago where all the machining for The Chizler is carried out. At the rear, everything is solid, with no springing and no damping.

The Chizler's principal braking comes from a Deist parachute packed and hung outside the rear of the roll cage. It's released by the driver via a lever temporarily installed before each run just to the left of the "butterfly" steering wheel. These chutes are made up specifically for dragsters and are of the ribbon type. They are re-packed by the owners and, of course, furnish a tremendous safety factor. Life of a properly-cared-for parachute is at least one full competition season.

FUEL

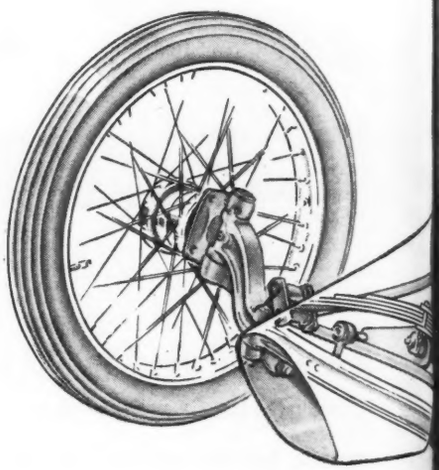
In a dragster of this type the all-important variable is the fuel used. The field is still largely one of experimentation with a great many factors involved that continue to defy definition and prediction.

Nitromethane is the basic element in all top dragster fuel mixtures, and the percentage used is the vital item. As the proportion goes up, the risks of engine damage increase dramatically. A 100 percent "mixture" *can* be used. But no one has used it pure and had much left at the end of a single run in the way of pistons, bores, and valves. Anything above 60 percent nitromethane mixture is a lot. For its record run, The Chizler was fed an 80 percent solution – which is something like trying to contain a Roman candle in a paper bag. The other 20 percent was made up of methyl alcohol (methanol), benzol, amyl acetate – and a few Chizler secrets.

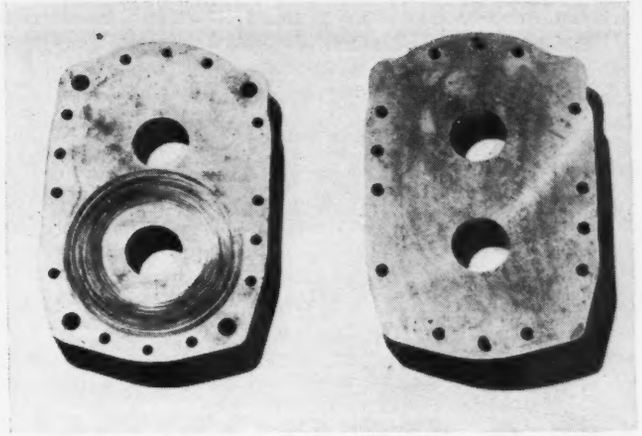
THE HOTTEST SEAT

The Chizler cockpit is stark in the extreme. Instrumentation is limited to two gauges for oil and fuel pressure indication. The pedal on the left is to let in the clutch, and there's an adjustable full-foot-with-toe-strap throttle pedal on the right. The "wheel" is a simple figure-eight segment of a 360-degree wheel and carries a "kill button" for instant interruption of the magneto current. The driver, supported by a full harness, straddles the rear end housing and his feet are close to the rear of the clutch housing in typical "slingshot" dragster style.

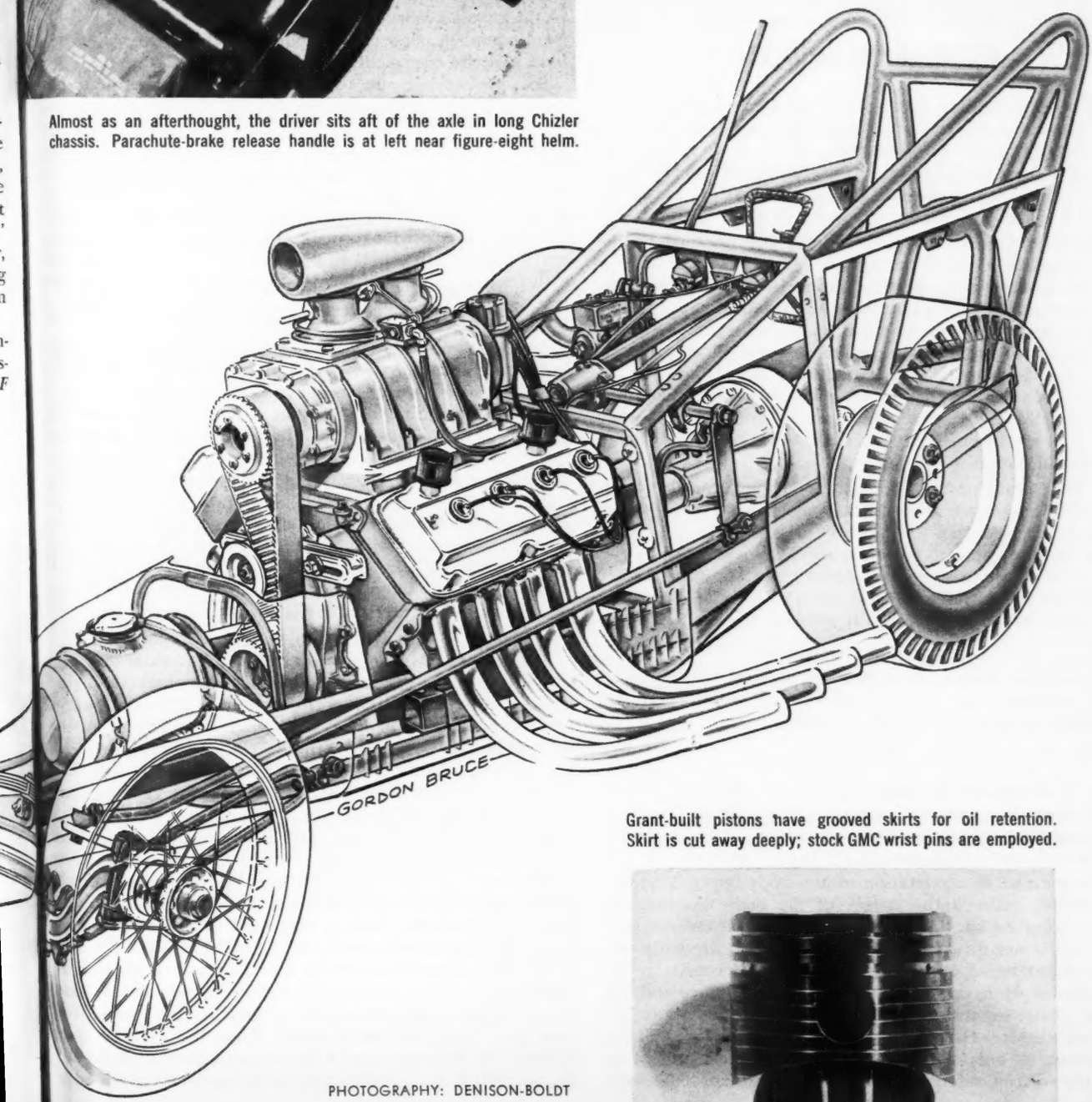
The Chizler – a projectile for straight-line racing. Entirely purposeful, startlingly efficient, and completely successful. *–DVDF*



Almost as an afterthought, the driver sits aft of the axle in long Chizler chassis. Parachute-brake release handle is at left near figure-eight helm.

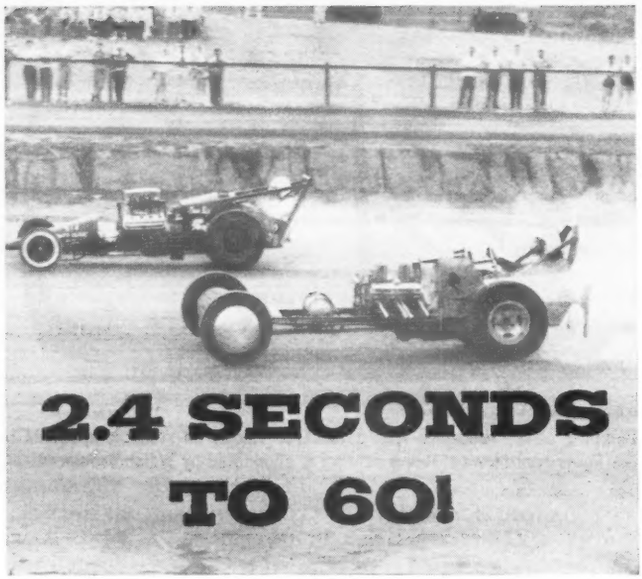


Pumping air at 7000-plus rpm puts fierce strains on stock components in the Roots-type blower. Heavy scoring is eliminated by Weiand replacement.



Grant-built pistons have grooved skirts for oil retention. Skirt is cut away deeply; stock GMC wrist pins are employed.

PHOTOGRAPHY: DENISON-BOLDT



CHANDLER

2.4 SECONDS TO 60!

by Roger Huntington

► It takes more than a quick 0-60 mph time to make a quick car. In the sports car enthusiast's usual frame of reference, the final criterion of "performance" is a car's lap time around a given road circuit. In this situation the acceleration in the higher speed ranges, top speed, braking, cornering power are just as important as the 0-60 time.

However, American enthusiasts who were weaned on the old "stoplight Grand Prix" can't help but judge overall performance by low-speed acceleration from a standing start. And since the 0-60 mph time is the most indicative parameter for this low-speed dig, American enthusiasts tend to search out this figure first when they read a new road test. They'll argue this figure with all the authority of a Duntov in an enthusiasts' bull session, even when they don't claim to know anything else for sure about performance. If they tune their car against a stopwatch, chances are the 0-60 time will be the target.

So even though SCI's editors don't believe the 0-60 mph time is an all-important yardstick for measuring performance (in fact, they question whether *any* precise stopwatch figures taken on one car can be fairly applied to another of the same model) we are obliged to make one big effort to get some truth out on the table, and try to lay to rest some of the 0-60 arguments that never really get laid to rest.

A FEW FUNDAMENTALS

Acceleration time from a standing start to any specified speed, assuming a constant rate of acceleration, can be calculated from a very simple formula:

$$T = \frac{V}{A}$$

where V is the terminal speed in feet/second and A is the acceleration rate in feet/second^2. Since 60 mph is 88 feet/second, a constant acceleration rate of, say 14 feet/second^2 would give a 0-60 time of 88/14=6.3 seconds.

Now the rate of acceleration of any body depends on the relationship between the *weight* of the body and the *net thrust* acting on the body in the direction of the acceleration. If the net thrust just equals the weight, the body will accelerate at one g. (gravity), or 32.2 feet/second. In the case of a car we have to subtract the wind resistance and tire rolling resistance from the total forward tire thrust to get the net thrust. However, since this total drag will be equivalent to only about 5 percent of the car weight at 60 mph we can safely ignore the effect in our 0-60 mph discussion. In other words, our effective rate of acceleration in g. will be equivalent to the total rear tire thrust divided by the car weight. For instance if the thrust is 1200 pounds and the weight is 2300 pounds our instantaneous acceleration rate is 1200/2300 = .52 g., or 16.8 feet/second^2.

Next question: what is the maximum possible forward thrust we can exert through rubber tires on pavement? This is a loaded question. Soon as we establish one theoretical limit the drag strip boys come up with a new slick-tread tire design and make fools of us. It's a well-established principle, though, that the maximum forward thrust that can be exerted by a tire will bear some more or less fixed relationship to the weight pressing down on the tire. This relationship is known as the "traction coefficient." It will average maybe .8 or .9 on a standard road tire; in other words if you had a load of 1200 pounds on the tire the maximum possible forward thrust would be, say, 1200 x .9 = 1080 pounds. Traction coefficients vary widely with different rubber compounds, road surfaces, load per square inch of rubber on the road, whether the tire is slipping, etc. A real hard long-wearing rubber, with high tire inflation on very smooth asphalt, might have a coefficient as low as .65 or .70 . . . and there is good reason to believe that modern "slick" tires for dragsters have effective coefficients as high as 1.40!

So now we're ready to calculate our minimum possible 0-60 mph time. Of course we'll need four-wheel drive to utilize the full tire traction (and car weight distribution will have to be carefully adjusted to come anywhere near doing this, since acceleration transfers weight from front to rear wheels). Then if we assume a conservative maximum effective traction coefficient of 1.30, and add 5 percent to the car weight to allow for torque lost in accelerating the rotating parts (wheels, tires, brakes, flywheel, etc.), we come up with a theoretical maximum acceleration rate of 1.24 g., or 39.8 feet/second. This figures out to a 0-60 mph time of 88/39.8 = 2.21 seconds.

And here's another slide rule tidbit to chew on: in assigning an effective traction coefficient of 1.30 with four-wheel drive we also assign our engine the job of providing a minimum tire thrust of 1.30 x car weight at all speeds up to 60 mph. If we substitute this value in the classic horsepower-thrust-speed formula, and allow a 10 percent friction loss in the drive train, we come up with a required weight/bhp ratio of 4.33 pounds/bhp! In other words a 3000-pound car would need a minimum of *693 bhp* to get up to 60 mph in the minimum theoretical time of 2.21 seconds – even if all other conditions were optimum!

Now let's see how close our various competition cars are coming to the theoretical barrier.

WHO'S QUICKEST?

There is no question whatever that the quickest 0-60 mph cars in the world are the special dragster machines. So right away your eyes light up and you think, "Prove it!" (You know these cars don't have speedometers or any means for accurately determining the true 0-60 time by usual road test procedures.) Well it so happens that this *can* be proved – thanks to a lot of hard work by a few progressive, experimentally-minded individuals in California.

Back in 1957 the National Hot Rod Association sponsored a series of tests on a California strip where sets of electric-eye clocks were placed every 132 feet for the length of the quarter-mile (there were thus ten time traps over the 1320 feet). Various types of drag cars were timed through these traps, from a standing start about a foot back of the first light beam. The quickest car off the line here was Jazzy Nelson's Fiat-bodied competition coupe with a nitro-fueled flathead Mercury engine. He timed 2.226 seconds for the first 132-foot trap and 1.245 for the second. Thus his average speed through the first trap was 40.43 mph, and 72.28 mph through the second. If we assume more or less constant acceleration

in each trap, so that he hits the average speed at the middle of the time interval, we can draw a rough graph showing mph vs. time. This suggests a true 0-60 mph time of somewhere right around 2 seconds flat.

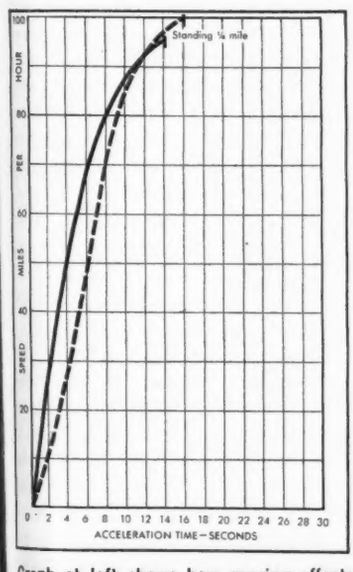
Admittedly this test method leaves much to be desired in determining initial acceleration off the line. With the car actually starting a foot or so back from the first light beam it has been proved that there is a time interval of maybe .4 second between the time the car starts to move and the instant it breaks the first beam. This suggests that we should add this .4 second to Nelson's 0-60 time of 2.0 seconds.

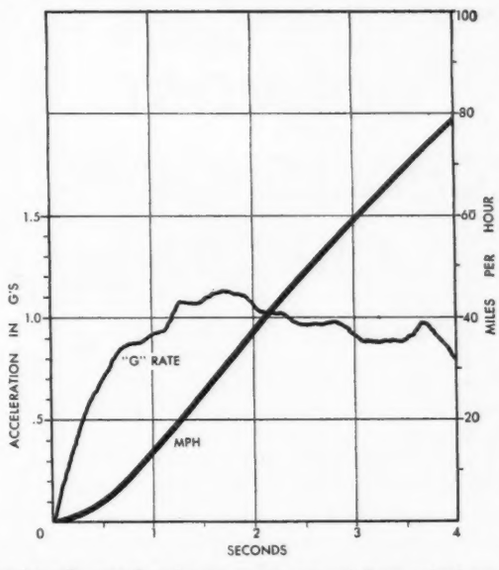
All this was proved in 1958 when DRAG NEWS magazine ran another series of tests where a sensitive electric accelerometer — an instrument that measures the actual acceleration rate — was mounted on the car, and its signal fed to recording apparatus at trackside that traced a continuous curve of acceleration vs. time. The connection was made by a 400-foot wire that trailed out of the back of the car and unplugged part way down the strip. The whole purpose of the test was to determine if dragsters actually did accelerate at better than 1 g. This was confirmed when the Chrysler-powered Cyr and Hopper slingshot recorded a peak of 1.12 g. at a point 1.7 seconds after the start. (Unfortunately the surface at the test strip was not noted for good traction, so these figures might have been bettered considerably on other surfaces.) Furthermore, the regular strip electric-eye clocks were wired into the recorder to indicate on the graph when the first light beam was broken; the graph showed this point to be just .38 second after the car started to move! All this gives us the right, I think, to place Jazzy Nelson's true 0-60 time at somewhere around 2.4 or 2.5 seconds.

We can also calculate the 0-60 time on the Cyr and Hopper dragster by integrating the graph of acceleration rate vs. time with a planimeter, an instrument that measures surface areas on graphs and drawings. This gives us a graph of mph vs. time, and from this I read a 0-60 time of 3.07 seconds on the C.&H. car. This car wasn't nearly so quick out of the chute as Nelson's car. The time period from the time it broke the first light beam to the 132-foot point figured out to 2.83 seconds — compared with 2.226 seconds for Nelson. In view of the fact that the C.&H. car recorded a peak of 1.12 g. under these conditions, I don't think it is at all impossible that modern dragsters with the improved M.&H. Racemaster slicks are getting g. rates and effective traction coefficients of at least 1.30 — and maybe as high as 1.50!

Anyway there is no doubt that these drag machines are the very quickest 0-60 mph cars in the world today (or any day), with minimum true times probably ranging between 2.2 and 2.5 seconds.

"... a theoretical maximum acceleration rate of 1.24 g., which figures out to a 0-60 time of 2.21 seconds..."





Graph at left shows how gearing affects quarter-mile speed and e.t.; curves are not from actual car. Other graph shows results of accelerometer test on Cyr and Hopper dragster, explained in author's text.

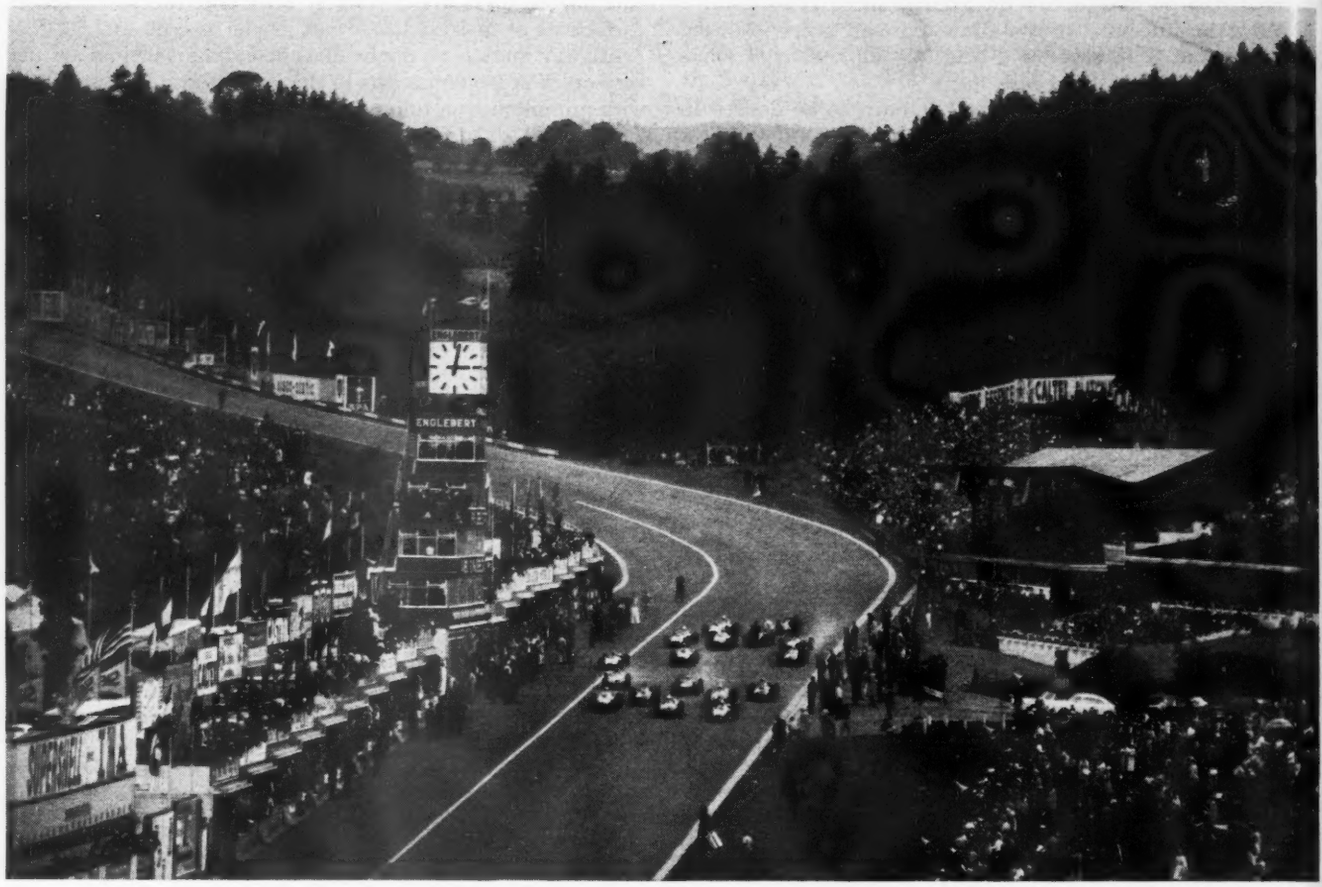
THE ALSO-RANS

When we get out of the field of cars designed specifically for short-distance standing-start acceleration our 0-60 mph times jump up appreciably right off the bat for a number of well-defined reasons. The two most important reasons are front-rear weight distributions closer to 50-50 than the usual 30-70 distribution of a drag machine, and the lack of those soft, slick-tread, big-area tires that give such a fantastic bite on asphalt and concrete. These slick tires give 40 or 50 percent more tractive thrust for a given load than standard road tires. And the effect of weight distribution is just as important. The faster a car accelerates the more weight is lifted off the front wheels and dumped on the rear ones by the inertia effect. This gives still more bite at the rear, and the effect multiplies. Thus a dragster with a static weight distribution of 30-70 (front-rear) may have 95 percent or more of its total weight on the rear driving wheels under full acceleration off the line! A sports car starting out with a static distribution around 50-50, plus standard road tires, hasn't a chance in this company.

Gearing is another factor that can have a big effect on the 0-60 time of a road car. You need to get your horsepower working in the low ranges, probably shifting gears at least once between 0 and 60, to get under way in a hurry. (Or it would be the same to say you need maximum torque multiplication in the 0-60 range.) I once graphed out the performance of the D Jaguar that won the 1955 Le Mans race, using my planimeter to convert bhp curves into acceleration curves. This car had 285 bhp and a 2.53 to 1 axle ratio. The power didn't come on in low gear until you were up to 70 mph or so! I figured the 0-60 mph time at 8 seconds flat — but with the car hitting 115 mph at the end of a standing ¼-mile. Contrast this with ROAD & TRACK's test of a production D Jaguar with 250 bhp and a 3.73 to 1 axle ratio. The 0-60 time here was a sensational 4.7 seconds, with a terminal speed of 107 mph at the end of the quarter. The production machine would have been some 300 feet ahead of the Le Mans job at the ¼-mile post, and the cars would be close to a half-mile out before the Le Mans car caught up. All this is due to gearing.

Add it all up and it becomes more and more obvious that the 0-60 mph time isn't the whole story on car performance. But let's get down to facts and figures and try to nail down specific types of cars.

Given reasonably normal gearing — neither for dragging nor for 150-mph cruising speeds — there seems to be quite close correlation between the true weight/bhp ratio and the 0-60 mph time. On this basis we will have to take our hats off next (after the dragsters) to the Mercedes-Benz Type W125 Grand Prix car of 1937. This meteor had 646 bhp lugging a gross weight (driver with small fuel load) of 2100 pounds, for a weight/bhp ratio of 3.3 pounds/bhp. Author George Monkhouse, in his book GRAND PRIX RACING, quotes a 0-60 mph time here of 4-5 seconds with race gearing. With optimum gearing a time of 3.5 seconds (*Continued on page 90*)



Seventeen cars roar off the mark to attack the world's fastest road-race track. Very fast bends make Spa . . .

THE MOST CHALLENGING CIRCUIT

by Jesse Alexander

► It had been two years since a Formula 1 race was held at Francorchamps. If current indications are any clue, the 1960 race may have been the last, for already the Royal Automobile Club of Belgium is complaining of a financial loss on this year's event. But it probably isn't the money; the Belgian national circuit is the fastest in Europe and the organizers are alarmed at the loss of two drivers this year, with Stirling Moss miraculously surviving a practice crash that gave *everybody* grey hairs. (see pages 18 and 19)

Fortunately, the two fatal accidents were not due to mechanical failure so far as can be determined, but both Moss's and Michael Taylor's Lotus Formula 1 cars left the road because of quite obvious material breakdown. It wasn't the organizer's fault, at least until the day arrives when the F.I.A. charges them to determine whether certain vehicles are "race-worthy", but it was questionable at Spa whether the Lotus Formula 1 cars were completely up to the loads imposed upon them at speeds over 130 mph. It was the first time the cars had been driven that fast.

Not only is the 8.76-mile circuit the fastest in Europe but one of the most beautiful as well, laid out in the midst of the Ardennes Forest and consisting of wide, well-paved portions of the Belgian national highway system. With only one really slow section from La Source hairpin down past the pits and up the steep, sweeping hill (one of the most spectacular sights in modern G.P. racing) the course consists of fast bends which are taken far above the 100 mph mark. Most cars are geared for a maximum speed on the 1.8-mile Masta straight of 175 mph.

The 1958 lap record stood at 3'58.3", held by Mike Hawthorn; in the very first day of training two years later Jack Brabham knocked 8.3 seconds off this time to get around in exactly 3'50.0" for an *average* speed of 136.7 mph, so tremendous have been the strides in chassis, engine and tire design in the intervening period. The circuit itself had not been improved noticeably so it's fair to attribute the faster times to tires and car alike.

Most drivers love Francorchamps; few hate it but occasionally one does hear the statement: "all it proves is who has the fastest car." Then another driver will contradict this completely, calling it the most challenging circuit in Europe. Despite these conflicting opinions, one thing is clear: considerable driving skill is necessary to extract the most from a car at Spa; if you once do get out of step and off your line in one of the fast bends the result can be disastrous. Certainly the several accidents this year should not force the curtailment of racing at Spa. On the contrary, if we want to profit from the lessons to be learned, organizers and constructors alike must take a long look at their responsibilities. Moss went through "his" corner at just over 130 mph when the wheel hub sheared; such structural failure must be avoided in the future by pre-race "bench" tests equal to aircraft standards.

As far as the race organizers were concerned there was complete chaos when Moss crashed and he was forced to lie in the ditch suffering for twenty minutes before an ambulance arrived. Had his injuries been critical (and at the time they indeed looked very serious) and had he not survived, the R.A.C.B. would not have been in a good light at all and would have come in for more criticism than is currently being

(Continued on page 92)

BELGIAN GRAND PRIX

June 19, 1960, Spa-Francorchamps

36 laps, 8.76 miles per lap

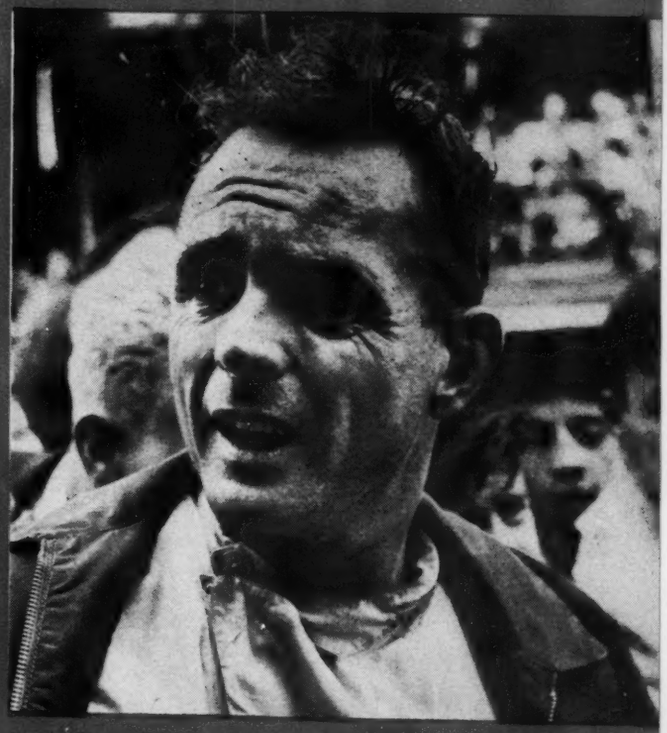
1	Brabham	Cooper-Climax	2:21:17.3 (133.33 mph)
2	McLaren	Cooper-Climax	2:22:40.6
3	Gendebien	Cooper-Climax	1 lap behind
4	Hill	Ferrari	1 lap behind
5	Clark	Lotus-Climax	2 laps behind
6	Bianchi	Cooper-Climax	3 laps behind

Fastest Lap

Brabham, Cooper-Climax, 3:51.9, 135.706 mph

Who said G.P. cars aren't dual-purpose? Scarab driven by Chuck Daigh turned taxi for Bonnier after his B.R.M.'s engine blew and Scarab's troubles persisted. They return to pits to watch.

Colin Chapman, Lotus director, Innes Ireland, his number-one driver, and Moss's mechanic, Alf Francis, left to right, have a go at plug checking.

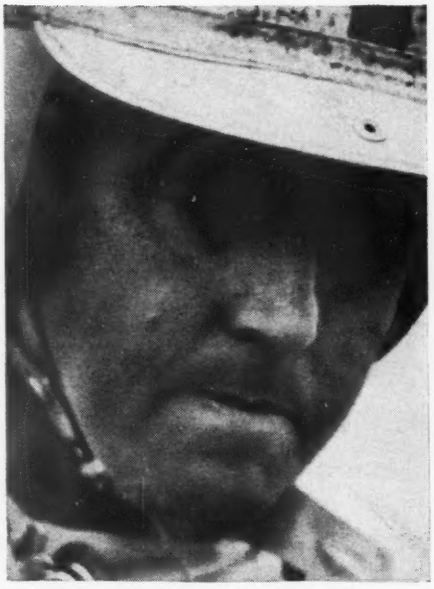


Phil Hill recalls the horrible sensation of realizing both you and your car are on fire. A broken fuel pressure gauge line let gas squirt on his legs. He put out blaze, but lost second place.

Jack Brabham speeds through La Source hairpin to win his second Grand Prix in a row, averaging over 133 mph in the '60 Cooper-Climax. Note the car's low, sleek lines compared to former C-C versions.

RACECRAFT AT RHEIMS

by Jesse Alexander



In a stirring wheel-to-wheel battle with Phil Hill's Ferrari, Champion Jack Brabham showed his mastery of . . . . .

► The 46th French Grand Prix, held this year at Rheims, was almost won by an American, with Phil Hill coming the closest yet to his one ambition of being the first American driver to win a modern European Grand Prix. For over half the race, at record speeds, he and Champion Jack Brabham fought it out wheel to wheel, "hub to hub" as the sports writers love to say. But bevel gear failure in all three Ferraris gave the race to Brabham on a silver platter. Jack commented later, "I was beginning to wonder how I was going to take care of that Ferrari if the pace had continued right up to the end."

Along with Graham Hill, Jack and Phil were on the front row of the starting grid. Graham failed to get his car in gear as the flag dropped and was left sitting on the line, to be rammed sharply by Trintignant's Cooper. Brabham and Phil Hill shot away together and halfway up the pit straight the Ferrari was a nose length in front of the Cooper. But Jack got himself into the lead quickly by virtue of the huge "tow" he received from the Ferrari. As they flew down the long back straightaway, the Ferrari was able to outbrake the Cooper noticeably.

Phil drove beautifully, determined to do an outstanding job and knowing that if any circuit favored the large Ferrari, it was Rheims. Phil was dogged closely by Von Trips, the two Ferraris often sandwiching Brabham's Cooper between them and arriving at Thillois hairpin more often than not with smoke coming off the tires as they attempted to slow from 175 mph to a crawling 40 mph. Hill said later, "It was incredible the tow we would give Brabham and if I attempted to get the same thing, I just couldn't slip-stream him since his car cuts a much smaller hole through the air."

For the first 15 laps the average speed stood at 132 miles per hour. Rate of attrition was high. The B.R.M.'s were all out within minutes—Gurney and Bonnier losing oil pressure and eventually breaking a valve spring. Graham Hill was out since the flag dropped, having been involved in the starting-grid "carambolage". After 25 of the 50 laps had passed, the Ferraris suddenly showed signs of wear. First it was Mairesse to come slowly down the long hill, his machine making strange noises, then it was Phil and finally Trips—all broken for the same reason.

A fierce battle for second place then developed between Olivier Gendebien and Bruce McLaren, Gendebien's 1959 Cooper being fitted with one of Rob Walker's Colotti gearboxes. Gendebien edged Bruce out of second place by a small margin and surprised everyone by his clean, capable display of driving.

At 35 laps the race was in Brabham's pocket and he toured around. His winning 131.6-mph average still didn't give Rheims the title of fastest European road circuit, Francorchamps in Belgium still retaining this honor by just 2 mph.

The Rheims field included the 1960 Vanwall. Driven by Tony Brooks, the car didn't show much promise since they haven't had enough time to test it properly this spring. Alterations since last year include rack and pinion steering, independent rear suspension and an all-new chassis. The fuel-injected engine remains, but giving a bit more bhp than last year's version. It's probable that the car will never be raced again and will be replaced eventually by a Lotus chassis with Vanwall engine. Brake troubles, handling difficulties and an oil-breathing engine all added up to nothing but headaches for driver and mechanics all weekend.

Connecting rod bearings had gone on all three Scarab engines at Rheims by the close of practice. This, plus the fact that their practice times were as much as ten seconds slower than the slowest car, was all that was needed to make Lance Reventlow call a halt to it all. Withdrawing his remaining entries, Lance and his crew have decided to pack up and go home to design a completely new car, presumably for the Intercontinental Formula, as he is not interested in 1961's 1.5-liter G.P. Formula.

Trautman and Barnes are far from discouraged; they've seen enough during their stay in Europe to know what's needed and by this time next year will have come up with an interesting new design, a competitive one. Lance is also not discouraged by the F.1 Scarab's flop. As he told me, "If you get discouraged, you get nowhere. We came to Europe knowing full well what our chances were. We've learned the hard way."

So it was Cooper 1-2-3-4 at Rheims this year. A bad day for most everyone else, and until Ferrari gets its rear-engined car running again, the race results are bound to stay the same. It would have been a far more interesting race had Moss been driving. Another interesting hypothesis: how would Phil Hill do in a Cooper?

This report can be brief because the race was. In fact, as this is written it is not clear whether or not the 46th Grand Prix de l'ACF is able to count for World Championship points, since the race did not last for two hours. Crux of the matter is whether or not the official C.S.I. regulations stipulate that a *Grande Epreuve* must be for two hours duration *and* for a distance of 300 kilometers. At Rheims the total distance was 415 kilometers, but time was less than two hours. No one seems to know whether the crucial word is "or" or "and" between time and distance. If the race is allowed to stand for the Championship, Brabham now is equal to McLaren with 24 points each, Moss lies second with 11, Gendebien third with 10, Ireland and P. Hill equal with 7, Cliff Allison with 6, Trips, G. Hill and Clark *ex aequo* with 4 each. *—JLA*

FRENCH GRAND PRIX

July 3, 1960, Rheims

50 laps, 5.16 miles per lap

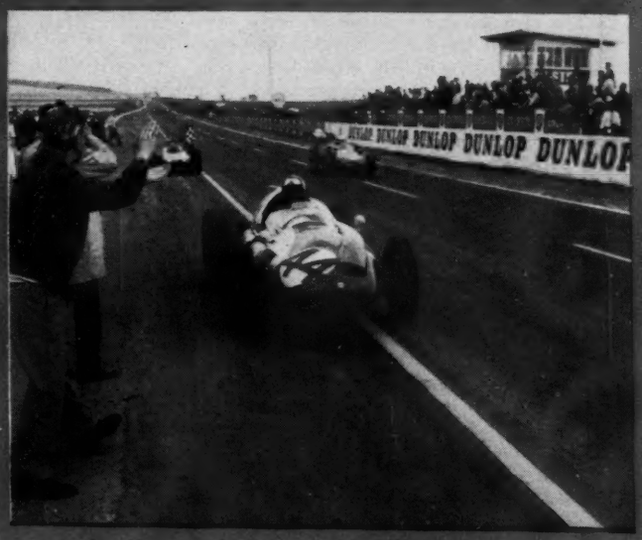
1	Brabham	Cooper-Climax	1:57:24.9 (131.7 mph)
2	Gendebien	Cooper-Climax	1:58:13.2
3	McLaren	Cooper-Climax	1:58:16.8
4	Taylor	Cooper-Climax	1 lap behind
5	Clark	Lotus-Climax	1 lap behind
6	Flockhart	Lotus-Climax	1 lap behind
7	Ireland	Lotus-Climax	7 laps behind

Fastest Lap

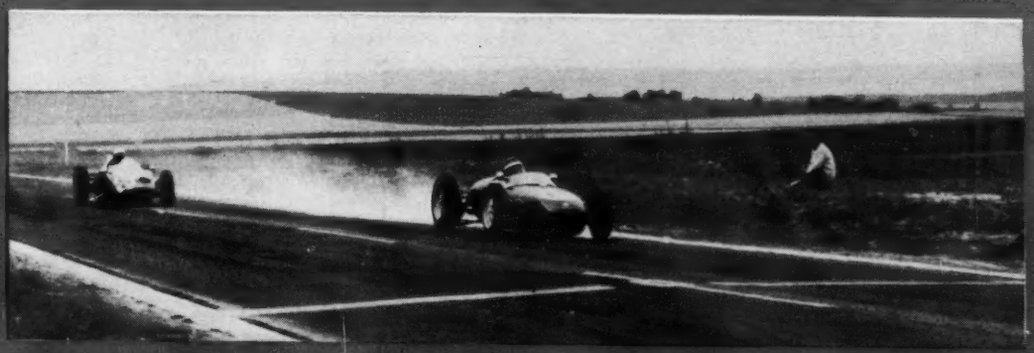
Brabham, Cooper-Climax, 2:17.5, 135 mph — new record

Previous record: Moss, B.R.M. 2:22.8, 130.5 mph

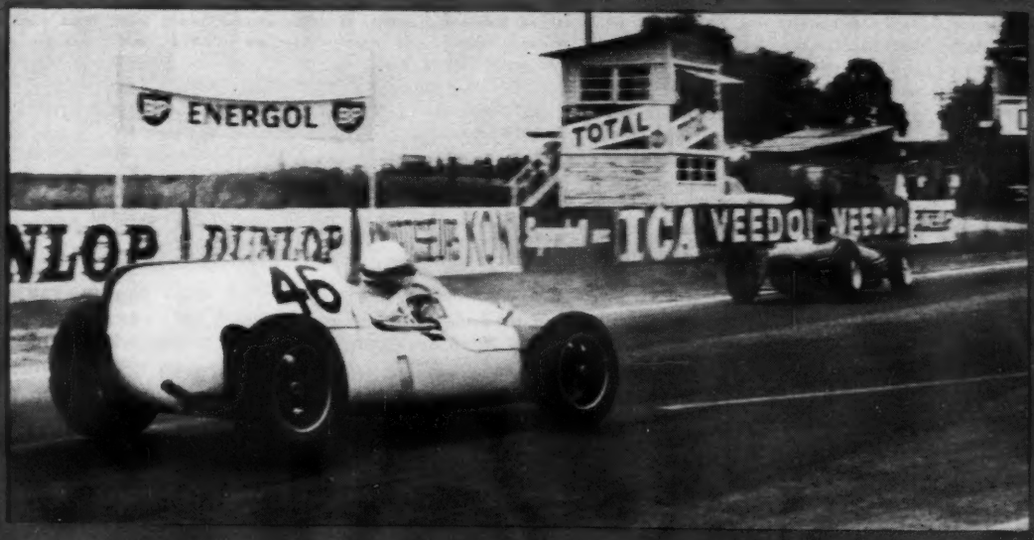
Tony Brooks, last year's winner at Rheims, holds the new, taut Vanwall in line. Car quit early with vibration-brake trouble from grid mishap.



Post-checker plaudits greet Gendebien who finished second to Brabham after up-hill fight, dice with Ireland and McLaren, and Ferrari failure.



Clark tries frantically to slow down for the hairpin at Thillois as is evidenced by heavy rubber smoke (above.) Unsuccessful, he heads down the road to Paris while Taylor deftly pilots his Cooper up a notch in the finishing list.



(*Le Mans report continued on page 80*)

ROAD RESEARCH REPORT: FERRARI 250/GT BERLINETTA

Continued from page 34

Berlinetta's hood and firewall are built for lightness, not silence.

The view under the forward-hinging hood is dominated by the big fiberboard chamber that mates with the hood scoop, supplying cool air to the carb intakes. The sole air filtration is a coarse screen in the scoop and only slightly finer screens in the carb velocity stacks.

GEARBOX AND GEARING

Both the Berlinetta and the 250/GT Spyder California use the exact same four-speed gearbox, with ribbed case and complete Porsche synchromesh, that was mated to the 1958 Testa Rossa. Less *Grand* and more *Turismo* Ferraris have different cases with different back covers and remote shift layouts to make room for the optional Laycock overdrive unit. The design is rugged, as infinitely refined in its own way as the engine, and it feels like it. Placed high beside the wheel, its lever is topped by the polished alloy mother and father of all gear shift knobs. Move it about and you feel the hard, metallic internal limits of its action. Thrust it from gear to gear and feel its clean, welcoming engagement, as quick as synchromesh allows — excepting the line from second to third, which is a little slower in this precise pattern than it is in some sloppier boxes.

The third from the lowest offered, the 8/32 rear axle gear set proved a good all-around cog, both for road use and for short-course competition. It's an odd ratio, though, in that the number of teeth on the ring gear (32) is a whole-number multiple of the number on the pinion (8), meaning that each ring gear tooth will always contact the same pinion tooth each time around. Usually the designer will try to insert an extra tooth here or there to produce a "hunting tooth" combination that will keep this from happening.

ROAD AND RACING ABILITY

The Berlinetta's performance was aptly summed up by a female passenger: "It's Instant Car," she said. Fond though we are of fast road machinery, taking every possible opportunity to exploit such cars to the full, we must admit that this 250/GT Ferrari has more sheer acceleration than you can use on the highway for more than a few seconds at a time. At whatever speed you're traveling those few seconds, at full throttle in the proper gear, project you so violently into another speed spectrum that you have to reorient yourself completely.

When we "took delivery" of the Ferrari its tires were practically new, and with their slick surfaces it was literally impossible to avoid a "chirp" or slight wheelspin when starting up from rest. If you're in a hurry, of course, wheelspin is a real problem, but with a limited-slip differential, plenty of weight on the back, and the smooth but strong single-disc clutch, you're able to make use of every bit of bite the pavement offers. You need it, too, when the tach flicks by 5000 and that mighty engine breathes deep for its second wind.

At the other end of the Ferrari's range, we've already mentioned its excellent manners in town. Pottering along at 40-45 mph in top gear, the Berlinetta gurgles and rumbles just below the "step" in the carburetion, erratically but not annoyingly. There's no danger of plug wetting, and just a tap of the treadle is needed to arouse the dozing cylinders. If you're wondering about mileage, expect about 15 miles per gallon on the open road — which will take you a long way on a glorious 31-gallon tankful. On second thought it might be better to have to fill up more often, just to be able to use that beautifully-recessed quick-acting filler cap.

BETTER BRAKES AND FRAME

One big reason for the 1960 Berlinetta's racing potential, one that may make it about equal to the 1958 Testa Rossa in lap-time ability, is its use of Dunlop disc brakes. SCI complained bitterly about the Ferrari drums over a year ago, urging that discs be fitted to the 250/GTs. They're here, and they transform the machine. Now there's completely progressive, stolidly durable braking with full balance and without chatter of any kind. No servo is fitted so you have to apply plenty of pressure, and there's a "springy" feel as you tromp on the pedal that feels almost as if the disc calipers are flexing under the stress of application. We looked under the car and sure enough, they *are* flexing — not a lot, but visibly.

Another major change to both the 1960 Berlinetta and Spyder California was a reduction in wheelbase to fractionally more than 94 inches, 8 inches less than it had been and just a couple of inches longer than the 1958 Testa Rossa, which had won praise as a good-handling car. As on the older Berlinettas the frame has a truss-like tubular superstructure along the sides under the doors, and something new has been added. The whole cowl and front end is carried and braced by a tubular network that verges on space-framing, daringly so for Ferrari. This made an already-stiff foundation even stiffer, and also supplied high front mounting points for the large-diameter tubular shock absorbers that are now fitted at all fours: above the upper wishbones in front and sea-legged in the rear.

SELF-COMPOSED CORNERING

The basic 250/GT suspension is unchanged, but refinements like these new shocks have moved it toward a softer, more flexible, deeper-kneed modern system. Another innovation on this particular car was the use of Pirelli's new Cinturato S tire, made only in this one size so far, and recommended only for use on Ferraris. There's no structural difference between this and the ordinary "belted" Cinturato tire, but specially sturdy fabric plies and careful, one-at-a-time manufacture make it possible for Pirelli to suggest the use of this tire at sustained speeds up to 160 mph (130 is the sustained limit with all other Cinturatos).

Detail improvements to an already top-notch chassis have brought forth a car that corners with immense composure. You just can't seem to catch it off-balance. Naturally, our Steering Behavior test was of unusual interest with this car; the results, on page 36, call for some discussion. First, the graph clearly shows strong understeer, with more and more lock being called for as speed increases, but the Ferrari didn't have the logy, slow response that often accompanies this kind of understeer. With quick steering and an embarrassing amount of power available the car was ready at any instant to have its radius tightened/opened or speed lowered/raised, at a rate of transition just as fast as you like. And when we came to the 55-mph point (the most valid 50+ mph we've recorded in this test) we forbore from added increments only because

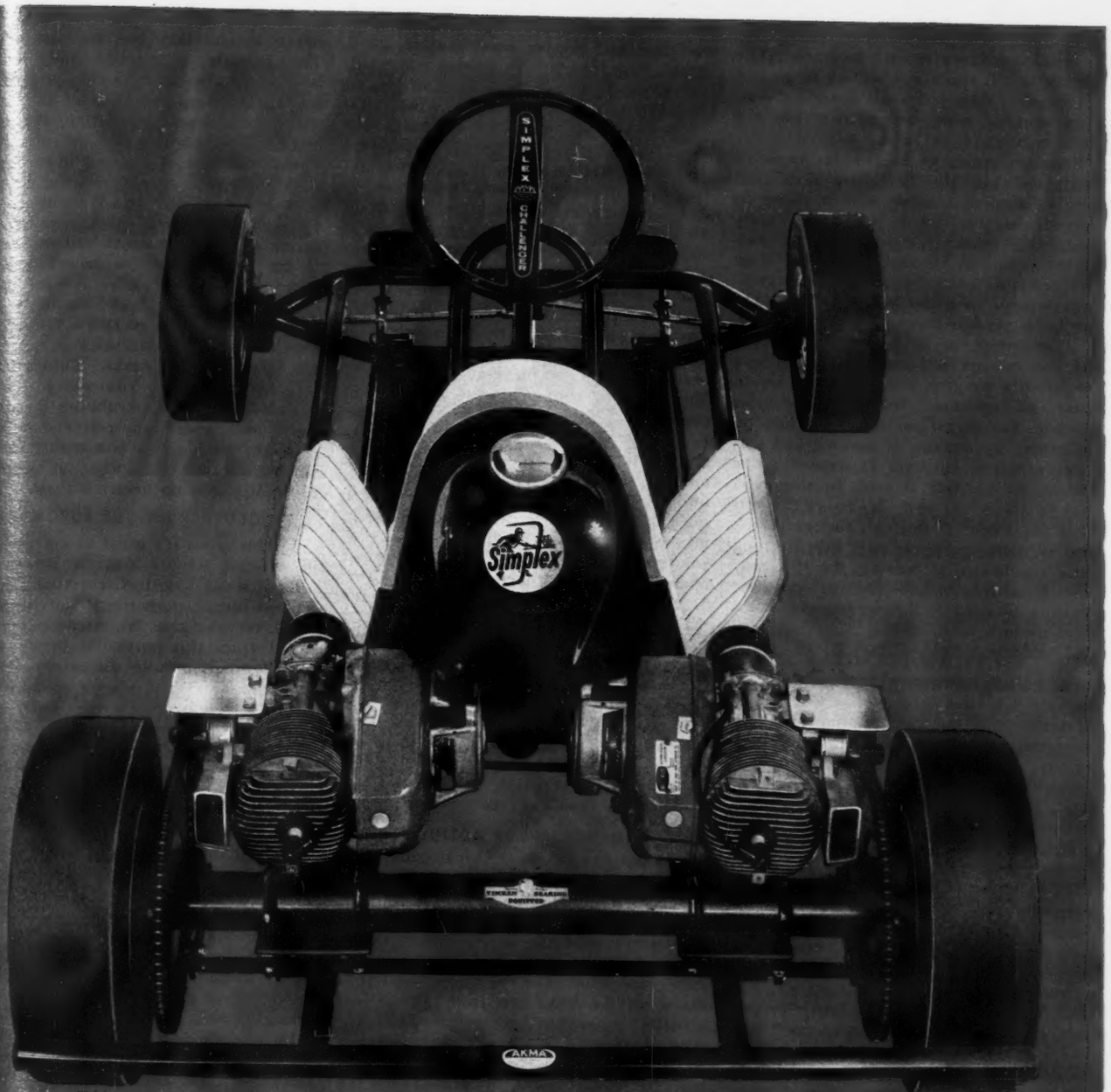
(*Continued on page 74*)

THE NUMBERS GAME by Len Prokine

What do you call a car? If you're from Detroit, you name it after a horse-drawn carriage (Phaeton, Victoria, Brougham) a tourist resort (Saratoga, Monterey, Southampton) or anything that sounds elegant, virile, or both (Galaxie, Le Sabre, Royal Lancer). Happily, enthusiast machines — sports and competition cars, classics, imports — carry, as a rule, more realistic designations. Some of these refer to engine displacement, some to horsepower, some to carrying capacity. Some are simply model numbers. But all have an authoritative and businesslike ring to them. How many of the following can you identify? To complicate things, we've arranged them in similar pairs. Certain makes are represented more than once. As a slight hint, we'll tell you there are no Maseratis, Ferraris, or Alfas, because among them, these machines have a virtual monopoly on all the available numbers and letters. There are no prizes, but if you can call all twenty pairs correctly, you know your automobiles.

1. 57	507
2. 403	404
3. 810	850
4. 300F	300S
5. J2	SJ
6. 44	4/4
7. 100S	SS100
8. 2CV	4CV
9. 1800	P1800
10. 3.8	3-6
11. 1500RS	SM1500
12. DS19	DV32
13. D-50	D-500
14. 400	700
15. Speed Six	Twin Six
16. Seven	Fourteen
17. 1200 TV	TF1250
18. XKSS	SSK
19. C2	K2
20. L29	L8D

(*Answers for The Numbers Game on page 74*)



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(*Continued from page 72*)

external conditions weren't favorable. The Berlinetta felt ready and willing to go just a bit faster, then just a bit faster yet — always working with you, offering you the tools with which to do the job.

From the inside we were never aware of much roll but the Berlinetta does cant over in corners, causing a little delay in response as you "set it up" and slightly hampering quick changes from one lock to the other, as through ess-bends. Ease and precision of the steering was a great improvement over last year's cars, making the latest version sheer delight to handle. The steering's never hypersensitive, but has just enough self-centering action and reversibility to give you a direct wire to those all-important front tire contact patches. Far bigger on one side than on the other, the amount of steering lock was another matter entirely. It seemed to be limited, on one side at least, by the bodywork in the wheel well. We'll bet this was what happened on this car, though: to be sure of passing the F.I.A.'s new turning circle regulation, at Sebring, the lock may have been deliberately offset to one side! What a shame if the scrutineers asked them to turn to the right.

IT EVEN RIDES WELL

For a fully-raceworthy Ferrari, the Berlinetta's ride was a revelation. It's firm, especially with the Pirellis pumped up to the pressures that suit fast cornering, but it's also level-riding with an uncanny resistance to pitching for such a short wheelbase. In this respect the Berlinetta can definitely be classed as comfortable, especially with a tank full of gas, which holds the back end right down.

It's happy that the ride is good, since the seats are built for firm support and not for pampering of sensitive posteriors. Beautifully, lovingly made of black leather, they have high bucketed sides that render you a "push fit" in the actual cushion width of 12-13 inches. A long (19½-inch) bottom cushion with an ample roll gives good support to the thighs, the whole seat being canted back at a most comfortable angle. The seat rails and adjustment mechanism are standard Italian, awkward and erratic in use, but the range of adjustment is ample. Leg room, as such, is surprisingly better than in last year's Berlinetta, in spite of the shorter wheelbase, yet the space situation still isn't satisfactory for long-legged types on account of the pedal placement. All three pedals are on the same plane, to facilitate heel-and-toeing, which means that the accelerator leg must be cramped if the other one is comfortably outstretched. One solution to this perennial problem might be to raise the seat an inch or so above its tracks, something the 36½ inches of headroom (more than in all but a couple of American cars) would easily allow.

WHEEL AND DASHBOARD

An ample 6½-inch clearance between steering wheel and seat is made possible by a new Ferrari technique: a universal joint in the steering column right behind the dash that allows the wheel to be slanted forward much more than in previous 250/GTs. This new position is top-notch, slightly on the high side and well away from the seat for maximum action room. Slim (1¾-inch) corner pillars, the high roof line and sloping hood account for a great improvement in vision forward. There's no more "Berlinetta Hunch" from peering through the old shallow windshield.

Constant reminders of the speed with which you're violating the countryside are the two big tach and speedo dials (to 8000 and 180 respectively) under twin hoods in the trimly tailored crackle-finished dash. An old Ferrari failing is the multitude of minor switches and knobs scattered at random across the bottom of the panel, in no special order and without identification.

Like all the recent Ferrari sports bodies, this one was designed by Pininfarina. It looks it too, being shaped with a clean tautness that's a pleasant reminder of Ferrari racing coupes of yore and even of the classic Pininfarina Cisitalia coupe. Especially attractive is the side silhouette and the tightly-wrapped tail. Unfortunately opening the lid of the latter exposes little but the huge gas tank and spare wheel, but there are a few crannies that could maybe accommodate a fitted lunch box. If you're having something made, its biggest open volume is dimensioned this way: 31 x 8¾ x 19 inches. Behind the seats the main area is a high, flat shelf 42 x 22 inches, not suited for carrying anything, but there is a ledge just ahead of it that can accept a volume of 33 x 8 x 8 inches. On this car it was partially blocked by a chrome-plated roll bar of very modest dimensions. Though this Berlinetta lacked the lockable glove compartment fitted to earlier cars on the line, it did have two 14 x 5-inch door pockets.

IMPRESSIVE IN ACTION

Pininfarina's design is executed by light-body expert Scaglietti, in Modena, which produces a coupe of remarkable lightness but not of impressive durability. Least satisfactory were the doors, which didn't sit firmly on their hinges and thus didn't close too well. The windows don't roll down all the way (the front lower edge actually protrudes forward through the edge of the door, as it is), and the window on the driver's side had ceased rolling altogether. Fortunately it ceased in the "down" position, since cockpit ventilation is no more than adequate. There is a fresh-air vent that blows helpfully on the driver's feet, and there is a complete heating system built right in as standard equipment. We couldn't try it out since the whole thing was disconnected on this car, to eliminate one more item that could fail in a race.

In spite of these details the bodywork is generally well-done, and the interior is specially successful in avoiding the "assembled" look that has always been typical of the G.T. Ferrari. It looks, and feels, much more as if it was designed as a whole and not just added later to give the driver someplace to sit. Even the view from the passenger's side is exciting in a cockpit like this one, as witness the reactions of one SCI staff member while being driven around Lime Rock Park by another staff member:

"You glance at the speedometer; its needle hovers over the 110-mph mark down the straightaway. There's wind noise, engine noise and exhaust noise. The timing stand blurs past. You feel an uncomfortable lurch as you brace against the heavy deceleration for the first corner. The throttle is cracked and you are pressed back and to the side unmercifully by brutal torque. A rush of hot, almost stifling air blasts back from the engine and smells of gasoline and hot rubber form a heady mixture. Through the corners you slam from side to side in the seat; the tach needle dances near its upper limit then plummets with the upshifts. Your driver sweats from effort and engine heat as he works over the wheel and gear shift. Before you realize it — in just the short time you've been watching what's happening in the cockpit — you're "lost" on the course and it takes a moment to get your bearings again. Things happen fast in a Ferrari! You sweep into the downhill turn, tires scrubbing for the last ounce of adhesion, the rear end bobbles a little and with a roar you streak down the straight again." Ah, what a shame the Mille Miglia is no longer with us.

ABSOLUTELY UNIQUE AUTOMOBILE

At this point it's usual to evaluate a car in relation to its cost, a process that usually sends reporters scurrying after far-fetched justifications when confronted with a $14,000 price tag. We intend to approach this Ferrari, this particular breed of 250/GT Berlinetta, quite differently. We ask this question: What other automobile, anywhere in the world for *any* price, can do what this car can? Can you conceive of another vehicle that, on one hand, is not at all out of place in ordinary highway use and, on the other hand, is a virtual cinch to finish in the top five in a major international sports car race? Even with an *unlimited* budget, do you think you could come up with a design that would blend these conflicting requirements as successfully as the 250/GT Berlinetta does? Give it some thought. We have, and we've come to the conclusion that this car is not only a bargain at $14,000; it's an absolutely unique piece of machinery that knows not a single peer!

In our dual test of the 1959 Ferrari Berlinetta and California (SCI, September, 1959) we complained about these things: seats and seating position, steering stiffness, ride, and braking. Every one of these points has been tellingly rebutted by Maranello for 1960, plus quite a few more internal items that only Ferrari could be conscious of. The result is an automobile of absolute top class, the finest genuine sports car we have ever driven. —*SCI*

(*Answers to The Numbers Game page 72*)

1. Bugatti ..... BMW
2. Peugeot ..... Bristol
3. Cord ..... Austin
4. Chrysler ..... Mercedes-Benz
5. Allard ..... Duesenberg
6. Bugatti ..... Morgan
7. Austin-Healey ..... Jaguar
8. Citroen ..... Renault
9. Triumph ..... Volvo
10. Jaguar ..... DKW
11. Porsche ..... Singer
12. Citroen ..... Stutz
13. Lancia GP ..... Dodge
14. Vespa ..... BMW
15. Bentley ..... Packard
16. Austin ..... Alvis
17. Fiat ..... MG
18. Jaguar ..... Mercedes-Benz
19. Cunningham ..... Allard
20. Cord ..... Chrysler

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My car is not listed. I have the_____

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☐ Alfa Giulietta Spyder Exhaust System	79.50	☐ Opel Rekord and Caravan	42.50
☐ Austin Healey Sprite	19.95	☐ Peugeot 403, Sedan only	49.50
☐ Borgward Exhaust System, All Models	39.50	☐ Porsche, all models but Carrera	44.50
☐ Fiat 500 With Heat Risers	29.50	☐ Renault 4-CV Exhaust System	19.95
☐ Fiat 600 Exhaust System, All Models	19.95	☐ Renault Dauphine Exhaust System	27.50
☐ Fiat 600, with sports manifold	44.50	☐ Simca Aronde	49.50
☐ Fiat 1200 Sedan	69.50	☐ TR-3 and TR-2 Complete 303-C System	34.50
☐ Jaguar 140M, 150, 150S	79.50	☐ Volkswagen, 1956 to 1959	34.50
☐ Jaguar 3.4	79.50	☐ Volkswagen, 1960 models	34.50
☐ Mercedes 190-SL Exhaust System	44.50	☐ Volvo—PV-444	19.95
☐ MGA	29.50		

California Residents Add 4% Sales Tax

INSIDE PONTIAC'S TERRIFIC TEMPEST

Continued from page 28

of the nearly-six-foot-long channel is closed by a spot-welded steel plate. Bolted between the engine and transaxle assembly, it holds the damper bearings and protects the drive shaft, while keeping engine and transaxle so stiffly aligned that the chassis may be driven without a body. It's this skeleton chassis which makes it possible to assemble Tempests on conventional production lines where the body is "dropped" onto the chassis. Corvair can only be built on "special" assembly lines where suspension and engine are brought up from the bottom to be hung onto the body.

The transaxle includes an automatic or manual transmission between independently-sprung rear wheels. The latter are driven by open axles with universal joints next to the differential carrier. The manual transmission is a standard three-speed synchromesh unit forward of the differential, with which it shares a common lubricant. The box is driven through the front (clutch) gear which has an internal spline mating with the driveshaft. The floor-shift selector rod enters the left side of the case. Standard differential ratio is 3.55 to one.

Designed in 1957, Tempest's air-cooled automatic (also with 3.55 to one axle ratio) is the first torque converter transmission employing the split-torque principle to reduce slippage. In high gear, drive power is split, with 60 percent of engine torque transmitted through the converter and 40 percent passing directly to the rear wheels by mechanical connection. The aluminum-cased three-element (gear case, differential, and torque converter) two-speed unit has an automatic upshift which depends on speed and throttle. Below 25 miles per hour it shifts to Low, if the throttle is pushed about halfway down. An upshift is made at 35 to 40 miles per hour with half-throttle loading. For maximum acceleration a full-throttle downshift is possible below 45 miles per hour. A manual downshift, allowable below 50, is for overrun braking or mountain use. The dash-mounted shift quadrant lists Reverse, Neutral, Drive and Low. Fluid level, 11 pints, is checked through a plate in the trunk floor.

THE SPLIT-TORQUE PRINCIPLE

Inside the Tempest automatic you'd find three hollow shafts connecting the torque converter, at the rear of the differential, with the gear case in front of the differential. The drive shaft is splined into the gear case to drive the smallest of the three concentric shafts, which turns the transmission gears and the torque converter pump. In Low there is no mechanical connection to the rear wheels, all power being multiplied and transmitted to the differential by the torque converter. This is accomplished by the converter's pump-driven turbine, which is rotating the hollow turbine shaft surrounding the inner

converter pump drive shaft. The turbine shaft then runs forward into the gear case where torque is multiplied by differential gears to give Low-gear pulling power.

To provide the 60-40 split of power in Drive, the Tempest automatic has been set so that in Drive there is a direct, geared connection between the drive shaft and differential through the high-gear clutch, and the front sun gear and planet set. At the same time, the torque converter is also being turned at engine speed. But because the torque converter multiplies torque to a greater degree than the sun and planet gears of the gear case, it applies more twist to the rear wheels through the rear sun gear than do the transmission's front sun and planet gears.

The closest analogy to the split-torque principle is a railroad's use of locomotives at the front and rear of a long train. The front engine, acting as direct drive, supplies some 40 percent of the power needed to move the train. The rear, or pusher engine, is the 60 percent torque converter. Its wheels are spinning as it works to produce just a little more push than the train can absorb. Tempest's split-torque converter works in somewhat the same way, as it too works a little harder than necessary to transmit maximum horsepower to the rear wheels. The 40 percent of direct gearing in the transmission provides a feeling of solidity not provided by most torque converters, and unusually good high-gear efficiency. In Tempest's automatic, the transmission and differential use different lubricants, with rifle-drilled shafts carrying transmission fluid from the converter through the differential to the gear case, and back again.

SUSPENSION NOVELTIES

The front suspension is said to be a Pontiac original. Independently-sprung rubber-bushed lower wishbones have "compression struts" giving a progressive increase in rate to control body lean. One end of the compression strut is bolted to the lower wishbone, and the other end is about 18 inches back in a rubber socket in the frame. The compression struts take the place of a sway bar, acting to increase stiffness only on the outer, heavily-loaded front wheel in a corner.

At first glance Tempest rear suspension looks like that used under Corvair, but Pontiac engineers claim it has been completely redesigned for use in the Tempest. The rear cross-member attaches to the body at four points, while the transaxle is mounted in rubber to the cross-member. A Tempest engineer told SPORTS CARS ILLUSTRATED, "The independent action of rear wheels shows up best on high-speed turns when car weight transfer tilts the outside wheel inward at the top to improve cornering and tire adhesion. But what's more important is that our front-engine, rear-transmission design gives the Tempest the long-desired 50-50 weight distribution between front and rear wheels."

Tempest may well be the hottest compact of 1961. The combination of a large four-cylinder engine — with high torque and rapid-acceleration potential — plus a light, unitized body and all-independent suspension makes it appear that Pontiac's baby is going to be the real fun car of the year. —*BC*

WOLFGANG BERGHE VON TRIPS

Continued from page 55

"That Opel was a sturdy sort," he laughingly recalls today. "My father would probably have it yet if I hadn't traded it for a British racing motorcycle. And did *that* cause a storm!"

In spite of his parents' initial displeasure at having the family transportation swapped for an impractical 250 cc J.A.P., Berghe was allowed to keep the bike until his school marks began to sag dangerously and he broke his arm in a spill. Then it was pre-empted to be applied to the purchase of a Jeep more suited to activities on the farm that surrounds the von Trips residence — a 50-room, tourist-attraction-type castle on the banks of the river. Afoot for the next two years while he served an "agricultural apprenticeship" (*landwirtschaftliche Lehrgang*, for which we have no exact equivalent), Trips honed his mechanical skill by patching the Jeep and tired farm machinery.

Away at Agricultural College in Bruehl, the titled farmer was still not allowed any funds for a car or motorcycle but he quickly traded a number of personal possessions for an elderly BMW to have "wheels." After rebuilding the cycle, Trips began competing in club events and soon established himself as a fast, gutty competitor. This motorbike racing experience, shared with such outstanding drivers as Nuvolari, Taruffi and Bernd Rosemeyer, is credited with giving the slender Teuton a feel for road adhesion that lets him drive with control on the ragged edge "or nearly always so," as a friend remarks.

On gravel, such as we find on many of the European hill-climb courses, Trips is a past master. As Richard von Frankenberg says in his book MEIN GELIEBTER SPORT, the 1957 Aosta Hill Climb demonstrated this when Trips, 6 seconds behind Hans Herrmann at the end of the paved stretch, made up 11 seconds in five miles to win by 5 seconds. He was also 10 seconds faster on the graveled curves than Hill Climb Champion Willy Daetwyler who was driving a more potent 2-liter Maser. To push so hard on an 11-foot-wide marbled surface bounded by sheer drops requires a certain type of personal confidence that typifies all of Trips's actions.

According to Frankenberg, the method Berghe used to introduce himself to the Porsche factory might be cited in this connection. In 1954, Trips was still attending the University when he rang up the works, got the switchboard operator and asked for Huschke von Hanstein.

Notifying the busy Racing Director, the girl said, "There's a Count Trips on the wire who would like to speak to you."

"Never heard of him," Hanstein replied.

"But he sounds so charming," the operator cooed.

"Charming? Well," laughed the *Direktor*, "in that case by all means let me talk to him."

At the other end of the line, Trips said, "I have recently won the Regularity Run of the Palatinate with an old 1300 Porsche. The overall victory. There were several 1500 Supers there and I beat them all . . ."

"And?", grunted Hanstein, unimpressed.

"Well," Trips argued, "with such an old 1300 you can't actually do a great deal. I mean if you ever have somebody looking for a fast co-driver or navigator on a bigger thing, I would like to go along."

Hanstein thought for a moment. "You know, young man, there happens to be an engineer from Wolfsburg named Hampel who wants to go down to Brescia day after tomorrow and he doesn't have a co-driver. Now if you'd like to do it and have time for the Mille Miglia, I can fix you up."

"What," asked Trips, "is the Mille Miglia?"

This may sound incredibly naive, but Trips had actually only held a regular driver's license (not a competition license) for a few months and the world of racing was as unfamiliar to him as cycle events are to the average reader of this publication. Nonetheless he joined Hampel for the "Thousand Miles" and, again, incredible as it may sound, the duo won the 1300 class beating out such veterans as Helm Glockler and Max Nathan. Trips drove a good portion of the Mille and caught the attention of Porsche in sound fashion.

After graduating with honors from the University, and thus becoming one of the few "pro" drivers with a degree, Trips went to work as a "learner" in a Munich bank to round out his preparation for managing the considerable chunk of Rhine property. This friendly institution gave him a leave of absence to go with Porsche to Le Mans in 1955 and has seen little of him since. But that the canny Count picked up an idea or two on the Bourse is quite evident in the way he conducts personal and business affairs. Unlike many wealthy or titled playboys who chunk it into the sport, Trips has never owned a race car and gets top dollar for his driving chores.

At Le Mans Trips was held in reserve by Porsche but his training laps were observed by no less an authority than Mercedes's omniscient Racing Director, Alfred Neubauer. The portly Neubauer crooked a finger and, with a boost up from Karl Kling, the young *Graf* signed on. Kling took an interest in Trips and shared with him an accumulation of many years of competition know-how.

Old-Timer Kling, now Racing Director himself, says that he had not expected his tutoring to produce such startling results as he discovered in the Swedish G. P. for Sports Cars which was Trips's first race for Mercedes. Karl took the lead but Trips had the nose of his 300SL tucked right in behind Kling's bumper. After a few laps the pupil even took first slot away from his teacher. This didn't last, however. Near the end of the go, the Rheinlander's red-hot brakes gave out and he strawbaled the Mercedes while Kling, who had gone at the same relative pace without overstressing the car, went on to win. But the "learner" from the Munich bank had served notice that he could go in fast company.

The following season Trips took on more and more of the responsibility for the family property and made only a handful of events. For Porsche, however, he won (with various co-drivers) the 1500 class at

Le Mans, Avus, the Nürburgring and Sebring, enough to give him the German Championship.

This honor wrought no appreciable change in the affable Count whose personality is described by most of his associates in non-technical terminology as "pretty normal." Even those who refer to him as "von Crash" praise Trips's demeanor. "He's got a tubful of guts", a Porsche mechanic said, and close friend von Frankenberg, one of the most literary of all automotive writers, refers to his "unworried courage."

Outside of racing this "unworried courage" is also reflected in Trips's poised behavior. Although Frankenberg also refers to the Count as "stable-disciplined", meaning that he can take orders and put a team effort above individual heroics, the grey-eyed Berghe has plenty of self-assurance whether he is talking to the team manager or a beautiful woman and a pointed question will elicit a similarly pointed answer from the voluble driver. For instance:

In 1956 Trips went with Ferrari for another whack at the Swedish Sports Car Grand Prix. Sharing a ride with Peter Collins he drove the 850 Monza for 98 out of the 153 laps and finished second only 45 ticks behind Phil Hill/Maurice Trintingnant, contributing to a first-five-place sweep by the red cars from Maranello. Feeling expansive, Commendatore Enzo Ferrari banquetted his drivers and chatted with them about future plans. Asked by the head man about his own ambitions, Trips looked the Italian in the eye and answered, "Now I want to drive Formula 1 for you."

Inasmuch as Ferrari had a stranglehold on the Championship at that time, this was somewhat like a minor league pitcher wiring Casey Stengel that he was available for the Series. But, taken only momentarily aback, Ferrari agreed to a tryout at Monza and almost handed Trips a chance to end his automobile love affairs forthwith.

Provided with a car for training, Trips turned in a few respectable laps and then failed to show up at the pits. Shortly after he was due, Eugenio Castellotti, who was also on the course, came flying into the pits to report that the novice was involved in a terrible accident at the *Curva Grande*. The "Big Curve" at Monza is a sweeping 125-mph bend and Trips was accelerating out of the sweeper when his car suddenly screamed for the wrong side of the track, ricocheted off a tree, somersaulted twice and smashed upside-down some 250 yards from where it had begun its gyrations. Going too fast to stop at the scene, Castellotti assumed that Trips was under the wreckage and crossed himself devoutly as he spoke.

The mechanics and crew hurrying on foot toward the curve were astonished to meet the German walking toward them, comparatively unhurt. He had been thrown clear of the flying Ferrari on the first flip and landed in soft ground alongside the paving.

Unhurt or not, wrecking a valuable Formula car is "not exactly the way to begin a beautiful friendship with a factory", according to Trips, and the builders were a bit cool for a few days until a thorough analysis of the balled-up machine revealed a broken steering arm which had caused the loss of control. All forgiven, the young driver was heralded in the Ferrari Yearbook of that season with a full-page photo — a rare honor — even though the list of his Ferrari placings was singularly short.

Far from being profound about racing, Taffy's approach is that the whole enterprise is providing him with an enviable opportunity to see the world in expenses-paid fashion. He remarks that under this arrangement he stays at the best hotels, mingles with the choicest chicks and intimately shares the thrills of a gripping sport — and all he has to do is risk his neck on weekends. An enthusiastic amateur movie maker, he lugs a 16-mm Bolex everywhere in the same traveling bag that contains a scarred helmet, driving shoes, gloves and two pairs of goggles. "I have thousands of feet of color film dating back to 1955," says Trips. "Someday I shall edit it all into the longest movie ever seen; Around the World in 80 Races." His other hobby is boating and the baggage rack fitted to his old Porsche coupe was put there for the express purpose of carrying an inflatable rubber boat.

What is this "urge for speed" that motivates drivers? The hackneyed question is so often put that there is hesitancy in mentioning it. But Trips has some definite ideas on the subject:

"We race for as many reasons as there are drivers. Each individual has his motivations but for any 'expert' to say that race drivers follow the sport because they are all suffering from an inferiority complex or are sublimating a self-destructive urge is sheer nonsense. I enjoy speed. I like the challenge of the car, the course and other drivers. It is like skiing. When one finds he has an aptitude for the slalom he does not stay on the beginner's slope, he seeks out more difficult and faster runs until he discovers those that give him the most pleasure and match his ability."

What effect does a serious crash have on a driver, say like the one at Monza?

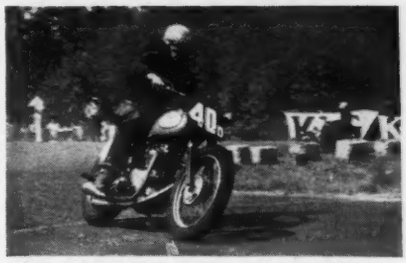
"That also depends on a number of things: the driver, the nature of the crash and its consequences. Sometimes an accident is the only thing that will correct a faulty driving style by teaching a strong lesson. Sometimes it will instill a distrust of the car or manufacturer. Sometimes it must be shrugged off as 'just one of those things'."

How about losing your nerve?

"I don't think a really brave driver loses his nerve, but there is no doubt that a serious crash will demonstrate to some that they shouldn't have been driving in the first place."

Switching from the narrow topic of driving to Berghe's personal philosophy brings up a barbed question: how does he get the most out of his existence?

"I think no man could be happy in doing nothing — unless he is lazier than anyone I have ever known. We are all creative; there is a driving force within us that needs expression. To gain the most from life we must expend that energy wisely. There is a satisfaction that comes only from a business or money-making effort, another from sports or play and another in romance. I merely try to strike a happy medium." —*OR*



Pierre has a winning way with anything on wheels; has led the pack in motorcycles, Formula 3 and bigger-bore machines.

He placed 1st or 2nd in fifteen 1959 races; won the SCCA Class E Production crown. (Warren Ballard photo).

Oilzum lubrication helped Mion's winning AC-Bristol finish every race without a single case of mechanical failure!

ENDURANCE IS EMPHASIZED

Continued from page 40

something that could only have happened to Ferrari, but sheer weight of numbers saved the day.

The Ginther/Mairesse Ferrari retired with a broken gearbox after Mairesse apparently strained things in the early hours of Sunday morning — actually racing! He increased his tempo so much that Frere had to speed up to stay safely in the lead.

Four of the 12 Ferraris were 3-liter V12 Testa Rossas — Mairesse/Ginther and Scarfiotti/Rodriguez were issued the independent-wishbone-rear cars while the rest had to be content with de Dion rear axles. It was interesting to note that none of the cars used the V6 2.5-liter Dino engine at Le Mans, which may indicate that the power unit has been shelved in favor of the tried and true 12-cylinder, at least for faster races. Interesting to note further that the G.T. Ferraris were just as fast — if not a hair faster — than the factory sports cars on the Mulsanne straight.

The Camoradi Maserati entry was impressive, to say the least. Mort Morris-Goodall replaced Piero Taruffi as team manager, and attempted to weld a certain amount of unity into the crew. Two of the 2.9 Masers were fitted with the biggest piece of plexiglas acting as a windshield that anyone has ever seen. If ever there was a living testimony to the stupidity of the current sports car regulations, this was it. Faired in to the body as much as possible, the windshield terminated at a point parallel to the driver's nose so that he could easily see over the top, proof positive that whatever regulation is thought up, car builders will get around it in one way or another. Masten Gregory set the pace in the opening laps, screaming down the Mulsanne straight so fast that even the jet-powered helicopter couldn't keep up. Short-circuits in the starting motors plagued Maserati and the starter was replaced on at least one car in the pits. The new rear portion of the Maser's bodywork increased its overall length by at least a foot and a half and aerodynamically was slightly mere efficient. The Gregory/Daigh Maser eventually broke its engine but left a stirring account of itself, easily the fastest car on the track that day.

The Jefford/Casner Maserati (Casner by the way is the guiding spirit behind the Camoradi Team) was bounced off a sand bank by an embarrassed Casner who forgot to mention the incident when he handed over to Daigh after the latter's car had thrown a rod through its crankcase. Daigh brought it back into the pits after about ten laps with the right front tire worn through from a rubbing fender, and with a gearbox full of sand. This effectively blunted the third and last point of the Maserati trident. It was a harsh blow after the failure of the Scarlatti/Munaron car after two short hours of racing.

Due to a practice accident involving one of its drivers, the two-liter Lotus Elite was withdrawn, a car that could have been as

fast as anything at Le Mans this year. Based on the Climax G.P. unit, its twin-cam engine put 170 bhp through a new all-synchro gearbox to a heavy-duty final drive. Front suspension was more rugged, like the current G.P. Lotus, and the disc brakes were appropriately enlarged.

The Chevrolet Corvette effort was impressive if not blindingly successful. One engine was deliberately blown in practice in an attempt to see just what liberties they could take on the gas available. The result was that the cars were reliable enough but were not really sufficiently fast to be impressive, for their engine size. The Cunningham/Kimberley car went out early when Kimberley got into a sudden spot of rain and was just a bit too fast. The car swapped ends before he could do a thing and was smashed up considerably, even starting a fire in the engine room.

Saddest Corvette mishap of all affected the Windridge/Thompson car, after they'd worked hard digging it out of the sand. It ran beautifully till noon on Sunday when suddenly — as Windridge passed the pits — a huge cloud of smoke poured out of the exhaust as the engine blew. Shortage of oil was the basic reason. Even though the crankcase was low on the car's previous pit stop the mechanics were unable to fill it since less than 25 laps had elapsed since the stop before that. Fuel could be put on at any time but water and oil cannot be added at Le Mans in less than 25 laps. The Camoradi Corvette driven by Gamble and Lilley ran regularly as did the Fitch/Grossman car. Buckets of ice for the Fitch/Grossman Corvette were necessary in the final hours to make it finish the race. The ice was packed solidly around head and block and had to be renewed often.

Motor racing *per se* stopped at Le Mans this year as soon as the Gregory/Daigh Maserati turned up its toes. Prior to this the spectacle of the three factory Ferraris charging through the "esses" and out onto the Mulsanne straight was exciting and spine-tingling. The noise of these three cars was more than most ears could take. But in a few hours the race settled down to a regular pace at which everyone tried as hard as he could NOT to strain his car, just to keep station and finish — to finish in the money.

The Ecurie Ecosse D-Type, now ancient and venerable yet still going strong, was a favorite this year in the hands of Flockhart and Halford in the beginning, but destroyed itself during the night. There were two privately-entered Aston Martins, the Border Rievers-sponsored car driven by Clark and Salvadori really being babied on Sunday just to finish — which it did, in third place.

As we noted last year Le Mans needs an overhauling. The present regulations are not realistic and are not the best for motor racing in our opinion. Many feel that this could be the last Le Mans in which sports/racing cars such as the Ferrari and Maserati will participate as the trend towards G.T. and production machinery takes hold. Even at the reduced speed of 20 of the 24 hours this year the pace was too much for many.

A final note: this was Paul Frere's last race. He's "retired" from racing before but presumably he means it this time. It was a terrific ending to a half-time job (he's a journalist) that was envied by many full-time drivers.

—*JLA*

MEXICAN KART BLANCHE

Continued from page 43

new factor and builders went to work on oversize tanks adapted from two-gallon cans, motor-scooter tanks and vintage headlight shells, and fabricated from Heliarc-welded, well-baffled steel sheet. Tank capacities ran as high as nine gallons.

I travelled with the Bug team in its efficiently, comfortably-outfitted Greyhound-type bus. A tube-steel rack the length of the top was filled with racing karts which could be raised and lowered quickly by means of a hand winch. The luggage bays in the sides were filled with tools, spare engines and other racing impedimenta. The interior, in addition to comfortable seating for two dozen or so, had a bed, multi-speaker radio and sumptuously stocked kitchenette-bar.

Everyone aboard was a racing driver or mechanic or both and the motor racing erudition was remarkable. Whether the subject was G.P. racing, karts, sports cars, motorcycles, Indianapolis, vintage Bugattis or Model A's, expert knowledge was rampant. As kart racer and universal authority Tom Noel double-clutched us over the mountains and petite Faye Pierson pithily recalled the events of Nassau, I visualized myself in W. F. Bradley's passenger seat, motoring over the original Targa Florio course while Vincenzo Florio explained the creation of Marsala wines. Fifteen miles out of Tecate we were overtaken by the Go Kart bus with fearless, race-anything Duffy Livingstone at its wheel. The ensuing dice through the mountain wilderness is left to the reader's imagination.

We rolled up to Mexican Customs at about five that Saturday afternoon. The officer stepped in the door, asked *"¿Pa' la carrera?"*, was told *"¿Como no?"*, and he waved us through with a smile. We rolled on to the town's one motel, on which Bug had acquired the basic patent, and unloaded. Then we went to examine the course.

With five passengers inside a VW (from which two kart 'cycles had just been removed) and six of us hanging on the outside we struggled over the route which had been marked with a line of lime, 'cycle-racing style. Groans of disbelief went up nearly every foot of the way: the ruts, dirt, bumps, curbs, length of straightaway all were overwhelming. We returned to the *meta*, the start-finish, and tuned in on popular opinion.

Can anyone finish a lap?

If anyone does, strike him a medal on the spot.

Every machine in the race will be destroyed.

Go Kart Club of America's Marvin Patchen said, succinctly, "The two worst things that can happen to you here are, first, that you can't get started and, second, that you can last to the finish."

Karts on the rooftops, karts on the tiles. Karts were booming through the traffic-filled streets.

Only the National Speed Trials at

Bonneville include the elements of anarchy, creativity, speed, power and sheer, exuberant motoring joy that prevailed at Tecate. Officialdom smiled . . . or looked aside. The local citizenry observed with an inscrutable mixture of awe, astonishment, amusement, tolerance. The karts sounded like and were driven like nothing ever seen before, above all in this outpost of human culture.

Good kart engines are like Maseratis in miniature, each with its own distinctive ball-and-roller-bearing howl. The West Bend-engined karts whined down the straightaway. Standing up a side street you'd hear their approach, muted by intervening buildings. Then they'd flash across the intersection and the sonic vibrations would come through smashing and unblurred. Then the McCullochs, howling far beyond the banshee scale, up around 14,000 rpm. Then one of the few Konig-powered machines in the U.S. Konig is a German manufacturer of water-cooled two-cycle engines for racing outboards who makes it a point to wrench about 34 bhp from 14 cubic inches — stock! The two-cylinder Konig comes by, sounding like the 16-cylinder B.R.M. in perfect tune. Your hackles rise, jaw falls, muscles and credulity go limp. This *can't* be, all this blinding performance from no cubic inches. But it's happening before your eyes.

Consider some figures. With weight-to-power ratios as close as five to one, gear ratios of around nine to one and rpm ranges that just don't quit, things are going to happen. According to the dynamometer of kart-component manufacturer Bob Palmini, a stock McCulloch MC-10 develops 12.5 pound-feet of torque from 5000 to 7000 rpm. With two of these on a kart running popular 8.4-to-one cogs you're putting 210 pound-feet through the rear axle in that rpm range. During hard cornering, which is *all* cornering, all the torque load is concentrated on one wheel, which usually stays together in spite of it all. High-frequency vibration plus lack of suspension requires that everything but the driver's eyeballs be lock-washered and/or locknutted, cotter-keyed, safety-wired or just plain welded in place. Every make of electric tachometer has been tried on karts. They come apart like a cigar ash.

The pits across from the Tecate Club on the main street were filled by ten a.m., 20 minutes of furious practice began at 11 and at high noon the starting flag fell. The big-engined Class C karts were pushed off with a roar like that of a fighter squadron. Fifteen seconds later the Super B wave was launched, then the Stock B, Super A and Stock A.

The main street's asphalt was only mildly bumpy. The first turn put you on unspeakably rutted earth which became dug up in proportion to the duration of the race. From there on most of the going was the same until the main street was reached again. Here it was possible to get up to maximum speed of 70 mph or so very quickly. During the first couple of laps everyone backed off to some extent and steered through the esses. But experienced drivers of karts have devious ways of managing their mounts, such as by shifting body weight strongly to make the kart's

(Continued on page 84)

(*Continued from page 83*)

rear end slide like a desk chair on wheels. Within three laps half the field was taking the entire straightaway wide open, keeping the front wheels straight ahead and dancing a sedentary hula.

It also was quickly learned that a good-handling kart works just as well on dirt as on pavement and cornering speeds were furious in spite of surface changes. It was a wonderful course except for all the high curbs, unyielding walls, dogs, kids and bumps. The continual bouncing in the air and coming down with a crash turned drivers into spectators starting with the first lap. The very sanitary Bug-Konig, the baby B.R.M. that was the terror of the meet, lost its dry-cell battery (all of the popular two-strokes have self-contained magnetos) in the first minutes of action. With each lap there were fewer machines in the running and more racked around the course with broken welds, cracked fuel tanks, shed chains, fractured wheels, even engines that simply came apart in all directions. But there were many others that, miraculously, ground on and just kept going faster.

The pit action was fascinating and fabulous. A kart zoomed into its pit with a breaking-up engine. A new one was installed in three minutes, during which the driver got everything but a shave. Dick Connors of Go Kart repeatedly used the same refuelling system. He would signal his pit that he wanted fuel the next time around. The next lap a two-gallon can was held out to him, flexpipe spout foremost. This he would grab on the fly and, on his next sprint past the pits, he'd fling it back . . . empty. Bug's petite, completely feminine and completely aggressive Faye Pierson would dash into her pit, her face-shield opaque with dirt and her fuel low. Her stops included refuelling and a drink of water in addition to bubble-shield mopping. They averaged 18 seconds. A kart was black-flagged for a loose rear wheel. The driver braked, spun the axle nut down finger-tight, stormed back into the fray, hit his pit, had the nut torqued down, all with the loss of about ten seconds. These scenes occurred by the hundreds.

The driving generally was of a very high order and speeds were genuinely awesome but every contestant did lose time in making repairs and by two p.m. only 36 of the required 72 laps had been completed by the leaders. The spectators were exhausted by the constant, deafening sonic punishment and it was no wonder that many drivers already hung limply to their wheels. This was a bronc-busting marathon as well as a race.

The sun marched down the straightaway and the contest went on but there was never a dull moment nor a repeated scene (I might just not take in Indianapolis this year). Then, as four p.m. drew near, so did the end of the world's first race of its kind. Because of the literally unbearable noise that he made with his 24-bhp Puch-engined Go Kart Special and because of his fine, spectacular driving style, Duffy Livingstone appeared to have the race to himself. But Duff had spent plenty of time in the pits too and when the checker first dropped it was for "Cub" Lyon. His mount was a jewel-like Caretta, the only one entered,

built by Art Ingels who built the prototype for the first Go Kart. This was Caretta's first important win and testified to the vehicle's structural excellence, the power and stamina of its twin seven-cubic-inch West Bend engines and to the handling qualities that the marque now possesses, as well as to the ability of the driver. Lyon was laden with trophies, also received a $200 cash award and a two-week, all-paid vacation for two in Mazatlan.

Second-quickest for the distance was Faye Pierson, a reminder never to underestimate the power of a woman, particularly of one who weighs less than 100 pounds and is at the controls of a good racing kart with a single, well-tuned MC-10 engine. Third overall was popular automotive writer Bob Pendergast, herding a West Bend-powered, Potvin-built Drag 'n' Fly (three started, two finished). Tecate's toothsome town Queens assisted at the ceremonies and the sympathetic *Jefe de Transito* (equivalent to our chief of state troopers or highway patrol) presided.

The whole thing rolled off perfectly thanks to absolutely outstanding organization and the enthusiastic teamwork of all concerned, notably the officials named, the assisting kart clubs and the good neighbors from both sides of what the Mexicans term The Frontier.

In addition to the fact that karts work as well on dirt as on pavement, it was learned that grooving slicks for bite on dirt is a waste of time in karting. Smooth and grooved were put to the ultimate test; both worked equally well.

Chain oilers are of doubtful value. Chains that were lubed only with sand seemed to work as well as their more pampered equals.

According to every participant I spoke with, and they were many, long-distance kart racing is wonderful. In spite of Tecate's course, it is less arduous than the few-lap heats and longer main events on miniature kart road courses. In these events you must be nervously taut from the green flag to the checker, without an instant's relaxation from one flag to the next. But in a long race over a roomy course you can let up, relax muscles, tendons and nerves from time to time, can stroke to last, can plan and apply long-range strategy.

Tecate revealed a new major arena for kart competition. Activity on rental tracks, short ovals and miniature road courses will continue to flourish and grow. But the *Grandes Epreuves* of karting from here on are likely to be just that: Big Trials. Sixty-six drivers started at Tecate, 28 finished. Within three days after the event Jerry Bielke had received calls from 31 drivers begging (a) that the event be made an annual one, (b) that several smaller events be held at Tecate each year and (c) that the course be allowed to remain as is. Leave it rough, dirty and rugged and don't change a chuckhole seems to be the general reaction of participants.

Go Kart Club of America is looking in northern Baja California for a Tecate-type course that will be safer and entirely paved. Why Mexico? Because there you enjoy relative *kart blanche*. An annual 100-mile Championship of the Americas held in Mexico City or Guadalajara is a pretty thought. —*GB*

THE FANTASTIC WORLD OF DRAG RACING

Continued from page 61

defined. It was shown by means of physical and mathematical logic that it would be a "scientific impossibility" to exceed about 167 mph in the quarter. This was assuming a maximum tire friction coefficient of 0.7, a limit which found few objectors.

It was in 1954 that e.t. began to come into its own. The Ardun-Merc-powered Yates-Mikkelsen dragster turned a 144 in 8.9 seconds and a 139 in 9.0. "It can't be done," the experts roared. "It takes a falling body 9.02 seconds to fall 1320 feet in a vacuum. To claim acceleration by an automobile in excess of one g. is to admit skullduggery with the clockwork."

This was a period of mass experimentation with horsepower and with means of delivering it to the pavement: chassis design and the development of ever-wider drag racing slicks. From '55 through '57 the impenetrable limit seemed to be firmly set at 155 mph. Then Emory Cook got a carbureted, fuel-burning 354-cubic-inch Chrysler going in a rear-engine roadster and broke through to 157 mph. He promptly dropped the engine in a dragster and whacked off an incredible 169 mph at Long Beach.

Such a mammoth jump was, of course, "impossible." But Cook went on to repeat his performance at Pomona, then in Illinois, Texas and Hawaii, where he blew two tires but whistled through the traps at 166 mph. Cook also was consistently quick: under nine seconds in e.t. He was so superior to all competition that he almost destroyed drag racing but, late in '57, the smarter operators mastered his combination and played their own variations on it.

Then-unknown Don Garlits of Tampa, Florida assembled such a Chrysler-based combination, cracked the 170 mph barrier with a 172 and followed with with a 176, the record which stood throughout '58.

It was in February of '58 that Calvin Rice set a new World Record for the standing-start kilometer by reducing Rosemeyer's 19.08 e.t. to 18.10 seconds. His blown Chrysler's displacement of 354 cubic inches made this also the International Class B record. Ed Cortopassi on the same date lowered the old Auto Union Class C record from 21.20 to a 19.21 e.t. using an unblown, 301-cubic-inch Chev V8 engine. These feats were covered in SCI for May of that year.

It was in '58 that the straightaway haulers began to master the GMC Roots-type supercharger. In mid-year the team of Cyr and Hopper got together with Chassis Research, builder of the Emory Cook machine. The pump-gas record of Mickey Brown had stood at 157.15 mph for nearly a year and Cyr and Hopper went after it with a blown Chrysler. They succeeded with an amazing 161.78 in 9.47 e.t., went to fuel and began running consistently in the mid-170 range, right on Garlits's heels.

Garlits, supercharged, then broke the new, "impossible" barrier by just topping

180 mph. Early in 1959 Art Chrisman retaliated with 181.81. Then came the DRAG NEWS competition rules which required a repeat run within two percent for a record to be regarded as official. At Spokane in mid-'59 Cyr turned 186.72 but blew his quick-change on the return run. Then in March of 1960 at Fremont, California Garlits clocked 187.10 mph and backed it up with a second run, although not improving on his September, '59 low e.t. of 8.23. And in April of '60 Chrisman smashed through the next ten-mph barrier with a backed-up 190.27 mph. In May, Cyr became the first man to break eight seconds e.t. with a 7.94 at Fremont.

One g. equals 32.2 feet/second^2. In traversing 1320 feet in 8.23 seconds. Garlits's *average* acceleration was 39 feet/second^2 or 1.2 g. Cyr's 7.94 e.t. equals 41.7 feet/second^2 or 1.3 g!

Also in May of '60 Mickey Thompson launched an attack on the World Unlimited and the International Class A and B standing start records for the kilometer and mile, which were held by Rice, Rosemeyer and Cobb. He reduced them by as much as 11 seconds. (SCI, September, 1960).

It had taken almost ten years to progress from 100 mph in the quarter mile to 190. The process had cost lives, untold fortunes and had been made possible by the incalculable efforts of countless speed hobbyists for whom the word impossible is unpleasant, irritating and often insulting. In the ten years the sport had acquired almost 700 strips, tens of thousands of contestants and annual attendance figures well up in the millions. And there was talk of breaking 200 mph. Those closest to the scene thought that it might be done by the end of the '60 season, certainly during 1961.

Chris Karamesines, a 30-year-old machinist of Aurora, Illinois, had never given thought to being the first man to break the magic 200. He had been active in the sport since 1953 and in early '59 he moved into gas dragsters, in partnership with mechanic Don Maynard, 25, and chassis man George Schreiber, 23. The team soon became jaded with runs in the mere 150s and prepared to switch to fuel. Their hometown sponsor, Al's Speed Shop, urged adoption of a Chassis Research TE-440 chassis for their blown, injected Chrysler and they began running consistently in the high 170s and low 180s. Chris's fame spread across the nation and, as one of the half-dozen or so top contenders out of thousands, he became an attraction sought after by major strip operators from coast to coast. Last March he accepted an invitation to run at the then-new Alton, Illinois strip.

The best speed of the car, "The Chizler," at that time was 183 mph. This is hauling fairly well but the Alton strip record was 189. Chris was running a new fuel combination and a new cam and had hopes of getting in some good runs.

He got his push start, rolled up to the line, held the hand brake, winged the earth-shaking engine and squinted through the choking nitro fumes for the snap of the starter's green flag. It fell and Chris

(*Continued on page 88*)

(Continued from page 87)

let off on the brake, cracked the throttle and feathered back on the clutch with the ideal precision that the best drivers strive for but achieve just once in a while. The machine's static inertia was overcome in an instant, dense smoke boiled off the slicks and the skinny rail shot down the course. The crowd held its breath for the 8.39 second moment that lasted until the roaring exhaust note cut off sharply and the braking parachute exploded into the car's slipstream.

The crowd knew that this had been a fast one, unlike anything seen before. Spectators came pouring out of the stands, milling, talking excitedly and waiting for news over the P.A. The first words unleashed a furor: "Karamesines's time is off the conversion chart. His speed will have to be computed."

It took time. The clocks were photographed before being cleared, then their calibration was checked and re-checked. The Chizler had accelerated from zero to 204.42 mph in 1320 feet. If there had been goal posts, the crowd would have torn them down.

Predictably and traditionally, the sceptics and displaced heroes have become shrill about impossibility, bad timing equipment, favoritism. The strip, a reputable one, has made every effort to insure accurate timing. In a sport that has at least a normal share of camaraderie mixed with the throat-cutting, Karamesines is careful to make no claims, to let his actions speak for themselves. "It was a very fast ride," he says. "I was in the car and know it. The spectators knew it. And I don't know what could be done to make the timing any more honest."

Karamesines's "204" has generated a large new crop of "phony-time" accusations. This has spurred DRAG NEWS, the enthusiastic, authoritative, quasi-literate organ of the sport, to stiffen its records governing regulations. For the record to be recognized and published in DN's "Standard 1320" list, it now must be backed up with another run within two percent of the claimed performance, then yet another run, on a different track which is under different management. This gauntlet will be run successfully, if not by Karamesines then by another American hobbyist, more or less similarly equipped.

One of the most interesting aspects of The Chizler's specification is its mass-produced chassis. After 20 years of devotion to building high-performance cars from New York to Honolulu, Scott Fenn decided to see if he could hack it in Southern California and set up shop there in 1950.

This is not the time to tell the story of Scott Fenn, his far-out feel for machinery, his ability to think as an incandescent exhaust valve, as a boundary layer within a combustion chamber or as a molecule of metal under complex stress. But, in '57, Fenn did a remarkable thing. He designed a dragster chassis for volume production, had it engineered, stress-analyzed, proved, until he knew he had a product that would have universal appeal and worth for drag racers everywhere. Instead of sacrosanct chrome-moly he, like Colin Chapman, chose ductile, more workable, weldable mild-steel tubing. Fenn's approach was scientific and, evidently, right. Today he

has almost 2000 Chassis Research machines operating on the nation's drag strips. They are hugely successful; at presstime, for example, of the 26 cars in the U.S. which are turning over 160 mph on pump gas, 19 are using his chassis.

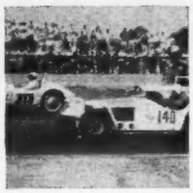
Nevertheless, through imitation you repeat the other guy's mistakes along with his successes and Karamesines has made extensive modifications to his Chassis Research chassis, uses his own front axle, cross-spring, shortened wheelbase and original steering linkage. Along with many other top contenders, Chris has learned that brute cubic inches are not necessarily a key to high dragster speeds and low e.t.'s; Chryslers can be punched out to 454 cubes but the one that turned the fast trick for Chris was a 392. He runs an eight-to-one compression ratio and drives his GMC 6-71 blower 1.22 times crankshaft speed. This is good for well over one bhp per cubic inch. At Alton he was running 85 percent nitromethane, good for another one-plus bhp per cube. With this combination his engine's output should be around 1000 bhp.

One of the more interesting and significant elements of Karamesines's combination is the use of 8.5-inch-wide slicks in place of the 9.5s he had run previously. For the last couple of years, every time a tire manufacturer would introduce a wider slick, speeds and e.t.'s would improve. Finally, slicks reached widths of 9.5 and 10 inches and a few thoughtful observers noted that performance with these super-wide skins did not show the anticipated proportional improvement. Fenn turned the information over to his engineering staff which came up with calculations which indicate that about 200 bhp worth of rolling resistance is developed by one 9.5-inch slick at 180 mph. Fenn promptly advised his clients to cut back in tread width and it is on 8.5s that Karamesines and Cyr have achieved their best performances.

The road-racing devotee may be inclined to dismiss straightaway competition as too simple, too devoid of challenge to merit his interest. He is entitled to his preferences, of course, but such a judgment is unjust. The driving skill required under rates of acceleration of the magnitude of one g. is exceptional, to say the least. The mechanical skills required to provide engine outputs of the order of 2.5 bhp per cubic inch are also exceptional.

The sport is growing in Canada and is very vigorous in Australia. Its significance and enjoyment at home and overseas would be greatly enhanced by another attempt at reorganization of the sport on a displacement-class basis. And if the F.I.A. would recognize (as we have urged) the standing-start half-kilometer (1639.4 feet.) as the minimum International Record distance, rather than the kilometer, the courses suited to safe F.I.A. acceleration-record attempts would be countable by the score rather than on a couple of the fingers of one hand, as at present.

These changes – use of a displacement classification and F.I.A. recognition of the half-kilometer record distance – could be expected to widen the scope of the sport through international record attempts in both small and large engine categories on a local basis. *–GB*



2.4 SECONDS TO 60!

Continued from page 67

should be easily possible. No modern competition cars would approach this figure.

Next up the ladder of weight/bhp ratios would come our own Indianapolis race cars. The lightest cars here weigh around 1600 pounds dry and have approximately 400 bhp in their 255-cubic-inch Offy engines. With true weight/bhp ratios between 4.5 and 5.0 pounds/bhp they should be able to turn 0-60 in 4 seconds or a little under with optimum gearing, even with their grabby clutches and two-speed gearboxes. I once graphed out the performance of one of these Indy "roadsters" with intermediate gearing (4.68 to 1 rear end; 6000 rpm at 125 mph). I came up with a 0-60 mph time of 5.1 seconds. As they run on the track they could probably barely turn it in 6 seconds.

The modern 2½-liter Grand Prix car would fall just above the Indy car in 0-60 potential. With dry weights generally between 1100 and 1300 pounds and 240-280 bhp, the true weight/bhp ratios will run between 5.0 and 6.0 pounds/bhp. The potential 0-60 time here, with optimum gearing, is probably between 4.5 and 5.0 seconds, but the cars couldn't approach this with race gearing. I recall an interesting test run by the editors of AUTOCAR magazine in the spring of 1956 on Stirling Moss's 250F Maserati. They put a fifth wheel on the back and the editor tried to get a few stopwatch figures under something less than ideal road test conditions. Standing-start tests were foregone in deference to the metal-to-metal clutch, but they got acceleration figures from 20 to 130 mph through the gears. By graphing these out and extrapolating in the part of the curve from 0 to 20 mph we can come up with a reasonable estimation of standing-start acceleration. This gives a 0-60 mph time of 6.3 seconds and, incidentally, a speed at the end of the quarter-mile of 106 mph, just about the same as the production D Jag. This performance would be bettered some by our 1960 G.P. cars, but not by much.

Most competition sports cars with big engines (3 liters and over) run above 6.0 pounds/bhp, but when geared for some of the slower courses they can turn in some excellent 0-60 times. Back in 1956 SCI tested Bill Murphy's Buick-powered Kurtis, with 315 solid horsepower and a 4.11 rear end, recording 4.6 seconds to 60. With about 340 bhp and a 3.70 final drive, the builders of the Chevy-powered Echidnas have come up with precisely the same figure. A properly-designed American-engined sports special shouldn't have much trouble sneaking in under the 5-second line, but it's not so easy for 3-liter sports-racing cars designed for international competition. When it was at its peak in 1957, the 300S Maserati made it in 5.5 seconds, exactly the same time SCI returned in 1958 for a "production" Ferrari V12 Testa Rossa.

So you argue it out from here! —*RH*

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The Marquis de Portago with world champion Juan Manuel Fangio at the French Grand Prix.

Alfred Neubauer, Stirling Moss (right) and Denis Jenkinson after their 1955 Mille Miglia victory.

The Cooper team, left to right: Jack Brabham, Bruce McLaren, John Cooper.

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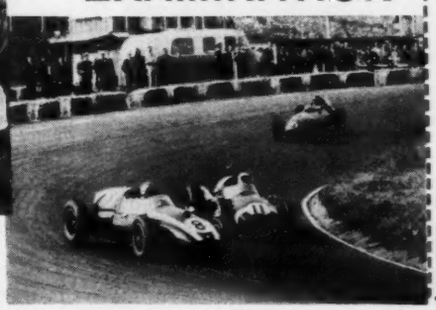

Moss (11) and Brabham (8) taking a corner at the Dutch G. P. Zandvoort

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THE MOST CHALLENGING CIRCUIT

Continued from page 68

heaped upon them. Flag marshalling was virtually non-existent on occasion and not one post even had a complete set of flags!

Among the 17 starters in 1960, only 7 had ever raced at Spa before. Stacey and Bristow were among the 10 newcomers, Stacey being completely out of his element as he was a short-track expert. His accident was reportedly due to his being hit by a bird. Bristow, however, was plainly "having a go" against Mairesse and got off his line in the same corner where Moss crashed.

(SCI received a letter from an eye-witness to these two accidents, Lawrence E. Buell, shedding considerable light on how they happened. His description follows:

"Bristow started into a diminishing-radius curve just after a long downhill straight. He was a little too high, and hit a hay bale with his left rear tire, then lost control of the car completely. His car swerved to the middle of the track, where it started rolling sideways. It shot off the left side of the track over an iron guard rail, dropped about ten to fifteen feet onto a roadway below, cartwheeled end for end once or twice, bounced back up over the guardrail onto the track again, where it rolled sideways some more until it came to a stop on the left side of the track, upside down. Bristow was thrown from the car and landed in the middle of the track, and from my vantage point on a knoll about 100 yards away, it was easily seen that he was dead.

"Stacey, just four laps later, negotiated the same curve and went on past me on a straight run. He had just passed the Malmedy exit when a bird swooped down and caught him full in the face. His car veered to the right, passed through some small trees and bushes just to the side of the track into an open field, where it rolled several times, landing upside down, and two to three minutes later caught fire. Conflicting reports of spectators in the area said that he was thrown clear, but others said that he was seen to be moving under the car just before it caught fire. I was not watching the car, but saw it before it stopped rolling, and saw no movement directly around the car before it started to burn.")

First day of practice saw B.R.M. running 16-inch wheels on the advice of Dunlop technicians who wanted to check their tire temperatures before allowing them to run the usual 15-inch wheels. Tires have not been the only things to get hot on the B.R.M. in the last few races, and temperature-reacting paint had been applied to all critical portions of the running gear at Spa in an effort to see just how warm things were getting.

The rear-engined Ferrari was absent at Spa as was Richie Ginther, sidelined in favor of the Belgian driver Willy Mairesse. The organizers were obviously more in favor of a third factory Ferrari in the hands of one of their own nationals. It's probable

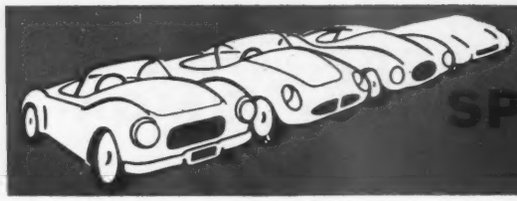
that they said a Belgian driver—or else no start and/or no start money. Arm-twisting, it's called. Phil Hill began to feel at home at Spa-Francorchamps on the second day of practice, being the only driver to improve his earlier laps during the second session. It was obvious that Phil felt at home not only because he liked the circuit but because he had confidence in his car. The big red Ferraris were just the tool to do the job on the Belgian course and Phil felt that the race could be his first G.P. win. A really sensational ultimate training lap of 3'53.3" put him on the right front corner of the grid, in sharp contrast to the two petite Cooper-Climaxes.

A cloudy sky with mist falling greeted the crowd at noon on Sunday and the prospects of a wet race were unattractive to everyone. Fortunately it saw fit to stop raining prior to the start and the track had dried completely before the flag dropped. First across the Eau Rouge bend at the bottom of the hill was Brabham, both Coopers getting off the mark slightly quicker than Hill's Ferrari.

Phil Hill had Jack Brabham looking in his mirror a good part of the race, but the second-place Ferrari wasn't able to get close enough to the Cooper to begin to try to pass. Phil hoped that the hot pace would force Brabham to overtax his car. Unfortunately Phil's luck was just not of the right kind to finish that day, for as he was streaking down the Masta straight he began to feel a spray of ice-cold moisture over his legs and on his face. The small pipe leading to the fuel pressure gauge on the dashboard had broken. Next thing to transpire was a flame licking about his pants as the stream of fuel ignited. Hurriedly stopping, he managed to put out the fire and restarted, having to push the car backward away from the roadside wall against which he'd parked.

The Reventlow Scarabs were sadly outclassed at Spa. In the period after the Dutch race both engines were torn down and checked and further detail chassis adjustment was attempted. Goodyear was finally able to supply them with the proper-sized racing tires for the rear flown in from Akron a few days before. During the race one car was shod with Dunlops while the other wore Goodyears in an attempt to get a comparison. Reventlow's engine let go on the first lap of the race, not a surprising occurrence considering the wear and tear perpetrated during three different G.P. training sessions. In addition Lance's transmission was acting up, jumping out of gear and thus unnecessarily bouncing the rpm above and beyond the safe margin. Daigh's troubles were two-fold. First the nuts on the cam covers broke and the final straw was when his header tank cracked. Daigh tried as hard as he could while still in the race.

Brabham led for the entire distance, never threatened as soon as Phil Hill was out of the picture. Olivier Gendebien gave the B.R.M. drivers fits, particularly Graham Hill who drove a beautiful race after Dan Gurney blew his engine, as did Bonnier. Graham could have finished second if the start-finish line hadn't been halfway down the row of pits. In mechanical difficulty on his last lap, Graham coasted into the pits and stopped, never once thinking to stop before the line and wait till the flag was dropped, to coast over. —*JLA*



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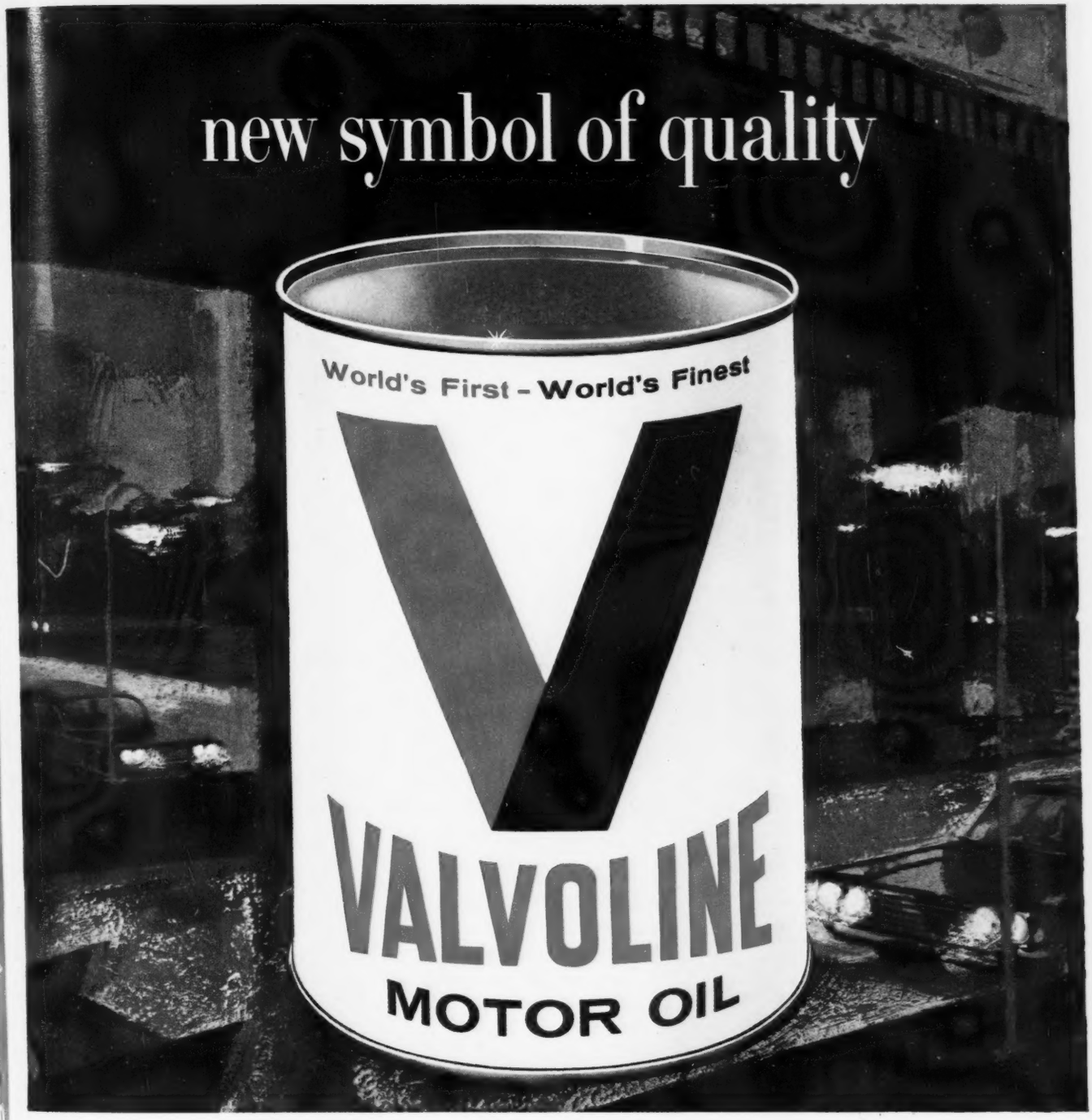

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